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United States
Department of
Agriculture

Cooperative State
Research Service

Food and Agriculture Competitively Awarded Research and Education Grants

Fiscal Year 1990

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FOOD AND AGRICULTURE
COMPETITIVELY AWARDED
RESEARCH AND EDUCATION GRANTS
FISCAL YEAR 1990

UNITED STATES
DEPARTMENT OF
AGRICULTURE

PREPARED BY THE OFFICE OF GRANTS
AND PROGRAM SYSTEMS, COOPERATIVE
STATE RESEARCH SERVICE

JANUARY 1991

FOREWORD

To maintain our competitiveness in agriculture in the world marketplace, scientific research holds the key. This is accomplished through a number of programs including research support distributed to universities on a formula basis through the Cooperative State Research Service. This publication reports the support provided through the following grant programs: Competitive, Special, Rangeland, and Small Business Innovation Research, as well as the Higher Education programs.

The Competitive Research Grants Program was developed to bring to bear upon agricultural research needs the best scientists in the Nation. Qualified scientists both inside and outside of the traditional agricultural research system may compete for and receive these grants. The focus is on agriculturally oriented fundamental research to discover the information needed before further important and necessary breakthroughs can be made in the applied research program. The programs include biotechnology, animal sciences, pest sciences, plant sciences, stratospheric ozone depletion, forestry research, and human nutrition.

The Rangeland Research Grants Program supports research to improve productivity of the Nation's rangelands.

In 1982 Congress enacted the Small Business Innovation Development Act that lead to the establishment, at the U.S. Department of Agriculture (USDA) and 10 other Federal agencies, of the Small Business Innovation Research (SBIR) Program. The USDA SBIR Program supports high-quality research proposals, from qualified small businesses, that address important problems facing American agriculture. In many cases university and Federal scientists serve as consultants or collaborators on these research projects. The USDA SBIR Program has proven to be an effective mechanism for commercialization of important agricultural technologies. Small businesses from 42 States and the District of Columbia have received support in a wide range of research disciplines.

The Special Research Grants Program addresses a number of agricultural areas of national and regional concern such as animal health and aquaculture, which are awarded on a competitive basis.

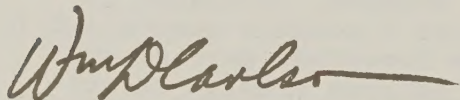
The USDA National Needs Graduate Training Grants Program, initiated in 1984, has achieved a notable record and is proving to be an important part of the solution to the serious erosion of our food and agricultural scientific expertise. The FY 1990 National Needs Graduate Fellowships Program supported pre-doctoral fellows in the areas of bioprocessing or food/agricultural

engineering; plant and animal biotechnology; food, forest products, or agribusiness marketing; food science/human nutrition; and water sciences.

Two new FY 1990 competitive grants programs were developed specifically to strengthen the capacity of universities to conduct food and agricultural sciences teaching and research programs.

The Capacity Building Grants Program, targeted to the 1890 Institutions and Tuskegee University, supported high priority research projects and teaching projects and addressing curricula design and materials development, faculty preparation and enhancement, instruction delivery systems, and student recruitment and retention. The aim of this program is to more firmly establish these institutions as full partners in the food and agricultural science and education system.

The Higher Education Challenge Grants Program was initiated to provide students

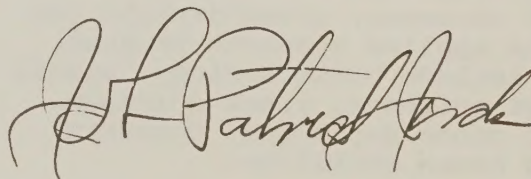


WILLIAM D. CARLSON
Associate Administrator
Office of Grants and Program Systems
Cooperative State Research Service

at U.S. colleges and universities with the highest quality education in the food and agricultural sciences anywhere in the world.

The Program supported projects focusing on curricula design and materials development, faculty preparation and enhancement, instruction delivery systems, and student experiential learning. All U.S. colleges and universities with baccalaureate or higher degree programs in food and agricultural science or business were eligible to apply.

It is our belief that this combination of research, teaching, and fellowship programs to attack significant and difficult problems in agricultural science provides the broad knowledge base necessary to reduce costs and solve pressing problems to keep U.S. agriculture strong, resilient, and competitive.



JOHN PATRICK JORDAN
Administrator
Cooperative State Research Service

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This publication was prepared by the Awards Management Division Staff, Office of Grants and Program Systems, Cooperative State Research Service, U.S. Department of Agriculture.

Limited copies are available from the following offices: CSRS Information Office, Room 328, 901 D Street SW, U.S. Department of Agriculture, Washington, DC 20250-2200, the Competitive Research Grants Office, Room 323, 901 D Street SW, U.S. Department of Agriculture, Washington, DC 20250-2200 and the Proposal Services Branch, Room 303, 901 D Street SW, U.S. Department of Agriculture, Washington, DC 20250-2200.

FOOD AND AGRICULTURE COMPETITIVELY AWARDED RESEARCH AND EDUCATION GRANTS FISCAL YEAR 1990

THE GRANT PROGRAMS

The research grant programs of science and education under which the competitive selection process was used during fiscal year 1990 were the following:

1. Competitive Research Grants Program to support basic research in the food and agricultural sciences.

2. Special Research Grants Program to support research deemed by Congress and the Department of Agriculture to be of particular importance to the Nation.

3. Rangeland Research Grants Program to support basic research in certain areas of rangeland research.

4. Small Business Innovation Research Program, a primary aim of which is to stimulate technological innovation in the private sector.

These sources of funding supplement and complement funding of Federal agricultural research and the basic State research institution formula funding by

Congress to help maintain a viable, effective, ongoing State-Federal agricultural research capability for this country.

In addition, grants were awarded competitively under the following Higher Education programs:

5. Food and Agricultural Sciences National Needs Graduate Fellowships Grants Program to help develop professional and scientific expertise in the food and agricultural sciences.

6. The Capacity Building Grants Program supports competitive grants at the 1890 Institutions and Tuskegee University to strengthen institutional capacities in food and agricultural sciences teaching programs and research.

7. The Higher Education Challenge Grants Program supports competitive grants to strengthen teaching programs in the food and agricultural sciences at U.S. colleges and universities.

Grant funds for all of the above programs are administered through the Cooperative State Research Service.

Guidelines for grants to be awarded competitively are normally published annually in the Federal Register, usually near the end of each fiscal year. The guidelines identify selected research areas, anticipated funding levels, and requirements for the submission of proposals.

Single copies or annual or semiannual subscriptions for the Federal Register are available for a small charge from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

If you want further information on programmatic aspects of these grants, contact:

Dr. William D. Carlson
Associate Administrator
Office of Grants and Program Systems
Cooperative State Research Service
U.S. Department of Agriculture
Washington, D.C. 20250-2200

If you want information on administrative aspects of these grants, contact:

Mr. Terry J. Pacovsky
Director
Awards Management Division
Office of Grants and Program Systems
Cooperative State Research Service
U.S. Department of Agriculture
Washington, D.C. 20250-2200

The following are listings of awards (arranged by program areas) for fiscal year 1990. Please note that some of these awards are renewals/amendments to existing projects and are identifiable by agreement periods starting prior to October 1, 1989.

COMPETITIVE RESEARCH GRANTS PROGRAM

The following tabulation lists the funds awarded in the various areas in fiscal year 1990 under the Competitive Research Grants Program.

Plant Science		\$7,347,948
Plant Pathology/Weeds	1,280,000	
Entomology/Nematology	1,580,000	
Genetic Mechanisms	1,140,000	
Nitrogen Fixation/ Metabolism	1,300,000	
Photosynthesis	1,105,636	
Soybean Research	461,676	
Alcohol Fuels	480,636	
Biotechnology (Animal and Plant)		\$17,798,700
Plant Molecular Biology	6,258,700	
Plant Growth and Development	2,950,000	
Plant Pest Science (Response to Biological Stress)	1,590,000	
Response to Physical Stress	1,100,000	
Animal Molecular Biology	3,425,000	
Animal Growth and Development	2,475,000	
Animal Science		\$4,680,276
Stratospheric Ozone Depletion		\$3,463,044
Pest Science		\$1,872,300
Human Nutrition		\$1,403,988
Forestry Research		\$3,743,652
Forest Biology	1,871,826	
Wood Utilization	1,871,826	
TOTAL		\$40,309,908

The authority for this program is contained in section 2(b) of the Act of August 4, 1965, as amended (7 U.S.C. 450i(b)). Proposals may be submitted by any State agricultural experiment station, college, university, other research institution or organization, Federal agency, private organization, corporation, or individual. Proposals from scientists at non-United States organizations are not eligible for support.

U.S. colleges and universities, other research institutions, Federal agencies, private organizations or corporations, and individuals may submit proposals.

PLANT SCIENCE

Grants are awarded in five broad areas of research in plant biology: nitrogen fixation/metabolism, plant pathology/weeds, plant pest science, genetic mechanisms for crop improvement, and photosynthesis. In addition, a small number of grants are awarded in the alcohol fuels research and soybean program areas. A brief description of each area of research, with a listing of research grants made during fiscal year 1990, follows.

Additional research grants covering the five broad areas of plant science and focusing on biotechnology are awarded under the Biotechnology program and listed in the Biotechnology section in this book. Proposals addressing similar scientific problems were reviewed by a single technical advisory panel regardless of the source of funds for the grants.

PLANT SCIENCE

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PLANT PATHOLOGY/WEEDS

(Biological Stress -- Plant Pathology/Weeds)

Research grants in this program support studies on stress on plants arising from their interactions with other plants and other microbial agents including fungi, bacteria, viruses, and mycoplasma-like organisms. The ultimate goal is to reduce losses in plant productivity from damage caused by biologically generated stresses.

Emphasis in this area is on studies that will enhance understanding of how stressful interactions are established between plants and other biological agents; how such interactions are influenced by environment and other factors inherent to the interacting organisms; how the interactions reduce plant productivity and usefulness to man; how plants react to stress generated by such interactions; and how the damage of such interactions may be reduced or eliminated.

Competitive Research Grants Program
Biological Stress - Plant Pathology/Weeds

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California Riverside, CA 92521	Jodie S. Holt	90-37151-5530 9000628	\$50,000	08/01/90 07/31/91	Physiological Basis for Competitive Relationships of Cotton and Perennial Weeds
University of Florida Gainesville, FL 32611	Richard D. Berger	90-37151-5427 9000927	\$80,000	08/01/90 07/31/92	Characterization of Waves of Plant Disease in the Early Stages of Epidemics
University of Florida Gainesville, FL 32611	Frank N. Martin	90-37151-5428 9000893	\$80,000	08/01/90 07/31/92	Genetic Exchange in the Genus Pythium

Competitive Research Grants Program
Biological Stress - Plant Pathology/Weeds

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Illinois Champaign, IL 61820	Stephen K. Farrand	90-37151-5434 9000688	\$56,000	08/01/90 07/31/92	Cis and Trans Acting Functions Mediating Ti Plasmid Transfer
USDA/ARS Mid-West Area Peoria, IL 61604	James V. Groth	90-37151-5431 9000765	\$80,000	08/01/90 07/31/92	Phenotypic and Genetic Diversity in Two Economically Important Rust Fungi
Kansas State University Manhattan, KS 66506	William F. Pfender	90-37151-5500 9001047	\$50,000	08/01/90 07/31/91	Microbial Antagonism and Biocontrol of Wheat Tan Spot in Conservation-Till Straw

Competitive Research Grants Program
Biological Stress - Plant Pathology/Weeds

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Kentucky Research Foundation Lexington, KY 40506-0057	Malcolm R. Siegel	88-37151-3860 9003194	\$50,000	07/01/88 06/30/91	Manipulation of the Fungal Endophyte for Use in Control of Pests
USDA/ARS Beltsville Area Beltsville, MD 20705	C. J. Baker	90-37151-5555 9000971	\$110,000	08/01/90 07/31/92	Role of Active Oxygen in Host Pathogen Interactions and Recognition
Michigan State University East Lansing, MI 48824	R. Hammerschmidt	90-37151-5430 9000839	\$61,000	08/01/90 07/31/91	Characterization of Induced Systemic Resistance Signal Molecules

Competitive Research Grants Program
Biological Stress - Plant Pathology/Weeds

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
North Carolina State University* Raleigh, NC 27695-7003	Gail G. Wilkerson	S90-37231-5558* 9000984	\$10,000*	08/01/90 07/31/92	Cultural and Genetic Factors Affecting Soybean and Weed Competition for Light
Dartmouth College Hanover, NH 03755	Nicholas J. Jacobs	90-37151-5347 9000705	\$100,000	08/01/90 07/31/92	Porphyrin Synthesis and Differential Susceptibility to Photobleaching Herbicides
Cornell University Ithaca, NY 14853	Michael G. Milgroom	90-37151-5432 9000988	\$33,000	08/01/90 07/31/91	Transmission of Hypovirulence in Population of Cryphonectria parasitica

*Grant split-funded with Soybean Research area where the actual count is included. Total amount awarded \$90,000.

Competitive Research Grants Program
Biological Stress - Plant Pathology/Weeds

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Cornell University Ithaca, NY 14853	Eric B. Nelson	90-37151-5501 9001044	\$100,000	07/01/90 06/30/92	Role of Bacterial Adherence to Fungal Cell Surfaces in the Biological Control
Cornell University Ithaca, NY 14853	Harvey C. Hoch	90-37151-5531 9000797	\$100,000	09/01/90 08/31/92	Thigmotropically Induced Proteins for Appressorium Formation in Uromyces
Ohio State University Research Foundation Columbus, OH 43212	Laurence V. Madden	90-37151-5290 9000709	\$50,000	07/01/90 06/30/91	Dispersal of Two Fungal Pathogens of Strawberry by Rain Splash

Competitive Research Grants Program
Biological Stress - Plant Pathology/Weeds

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Oklahoma State University Stillwater, OK 74078-0500	Margaret Essenberg	90-37151-5429 9000882	\$90,000	08/01/90 07/31/92	Localization of Phytoalexin Biosynthesis and Targeting in Cotton Foliar Tissue
USDA/ARS North Atlantic Area Philadelphia, PA 19118	Stewart M. Gray	90-37151-5275 9000655	\$80,000	07/01/90 06/30/92	Molecular and Cellular Deteminants of Aphid-specific Luteovirus Transmission
Washington State University Pullman, WA 99164-1030	Hei Leung	90-37151-5433 9000835	\$100,000	08/01/90 07/31/92	Genetic Relationship Between the Dwarf Bunt and Common Bunt Fungi of Wheat

TOTAL : \$ 1,280,000

PLANT SCIENCE

PLANT PEST SCIENCE/INSECTS AND NEMATODES (Biological Stress - Entomology/Nematology)

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Research grants in this area support studies on plant stress arising from interactions with insects, nematodes, or mites. The ultimate goal of the program is to support research which will lead to ways of reducing losses in plant productivity from damage caused by these organisms.

Research on plant/insect or plant/nematode interactions is encouraged as is research into the basic biology of these particular invertebrates. Specific emphasis is placed on but not limited to the following areas: 1) mechanisms of plant defense and resistance against insect or nematode attack (biochemical or genetic); 2) insect or nematode growth, development, and reproduction (physiological, biochemical or molecular studies); 3) physiological and ecological interactions of biological control agents with their hosts (includes beneficial insects, viruses, bacteria, fungi, and other organisms); 4) chemical ecology and behavior; 5) population dynamics (includes evolutionary studies); and 6) fundamental basis of pesticide toxicity and resistance.

Competitive Research Grants Program
Biological Stress - Entomology/Nematology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California Berkeley, CA 94720	Alexander H. Purcell	90-37153-5435 9001282	\$85,000	08/01/90 07/31/92	Vector Transmission of a Xylem Limited Bacterial Plant Pathogen
University of California Berkeley, CA 94720	Loy E. Volkman	90-37153-5556 9000667	\$60,000	09/01/90 08/31/91	AcMNPV T.ni Midgut Interaction
University of California Davis, CA 95616	Richard Karban	90-37153-5264 9000996	\$120,000	07/01/90 06/30/92	Negative Interactions Between Mites on Grape

Competitive Research Grants Program
Biological Stress - Entomology/Nematology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California Riverside, CA 92521	John T. Trumble	90-37153-5579 9001289	\$100,000	09/01/90 08/31/92	The Impact of Acidic Fog on Native Plant Insect Associations
University of California Santa Barbara, CA 93106	William W. Murdoch	90-37153-5237 9001248	\$120,000	07/01/90 06/30/92	Dynamics of Parasitism and Host Feeding in Aphytis
University of Georgia Research Foundation, Inc. Athens, GA 30602	Richard S. Hussey	90-37153-5676 9000904	\$60,000	09/15/90 09/30/91	Characterization of Disease-Inducing Secretions Produced by Root-knot Nematodes

Competitive Research Grants Program
Biological Stress - Entomology/Nematology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Hawaii Honolulu, HI 96822	C. Womersley	90-37153-5580 9001263	\$85,300	08/01/90 07/31/92	Studies on Adaptations to Dehydration Survival in Entomopathogenic Nematodes
USDA/ARS Mid-West Area Peoria, IL 61604	Adrianna D. Hewings	90-37153-5468 9001384	\$100,000	09/01/90 08/31/92	Barley Yellow Dwarf Virus Epidemics: The Role of Intrafield Spread in Wheat and Oats
Purdue Research Fdn. West Lafayette, IN 47907	Larry L. Murdock	90-37153-5439 9001259	\$45,000	09/01/90 08/31/92	Lectins as Plant Defenses Against Insects

Competitive Research Grants Program
Biological Stress - Entomology/Nematology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Kentucky Research Foundation Lexington, KY 40506-0057	Kenneth F. Haynes	89-37153-4354 9003145	\$50,000	07/01/89 06/30/91	Redundancy in Chemical Communication
University of Massachusetts Amherst, MA 01003	Ronald J. Prokopy	89-37153-4361 9001254	\$180,000	07/01/89 06/30/93	Tephritid Fly Movement and Patch Use in Relation to Interacting and Variable Resources
USDA/ARS Beltsville Area Beltsville, MD 20705	Minh-Tam B. Davis	90-37153-5557 9001304	\$120,000	09/15/90 09/30/93	Characterization and Localization of PBAN Receptors in Heloithis zea

Competitive Research Grants Program
Biological Stress - Entomology/Nematology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Maine Orono, ME 04469	Eleanor Groden	90-37153-5436 9001235	\$85,000	08/01/90 07/31/92	Population Dynamics Approach for Developing a Use Strategy for Antifeedants
Michigan State University East Lansing, MI 48824	J. Mark Scriber	90-37153-5263 9001276	\$100,000	07/01/90 06/30/92	Influence of Host Suitability and Phenological Constraints on Host Use Patterns
Michigan State University East Lansing, MI 48824	James R. Miller	90-37153-5437 9001309	\$120,000	08/15/90 08/31/92	Isolation, Identification, and Behavioral Effects of Onion Fly Sex Peptide

Competitive Research Grants Program
Biological Stress - Entomology/Nematology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Cornell University Ithaca, NY 14853	Martha A. Mutschler	90-37153-5438 9001343	\$70,000	09/01/90 08/31/91	Biosynthesis of Acyl Sugars and Insect Resistance In Lycopersicon
An Individual Award Columbus, OH 43214	Mercedes A. Ebbert	90-37153-5477 9001322	\$66,000	09/01/90 08/31/92	Coevolution Between the Corn Leafhopper and Corn-Stunting Mollicutes
University of Wisconsin* Madison, WI 53706	Kenneth F. Raffa	S90-37250-5581* 9001318	\$13,700*	09/15/90 09/30/92	Role of Root Invading Insects and Fungi in Patterns of Host use by Bark Beetles

TOTAL : \$ 1,580,000

PLANT SCIENCE
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GENETIC MECHANISMS

This program covers the broad area of plant genetics. The goal of the program area is to encourage quality research projects that will contribute to the increased basic understanding of biological phenomena relevant to the development of superior varieties of agricultural crops. New and innovative experimental approaches are emphasized at all levels including the molecular, biochemical, cellular and whole plant levels. The research areas that are given high priority are: (a) acquisition of basic information on the structure, function and expression of plant nuclear organellar genes, (b) development of methods for gene transfer and genetic engineering, (c) development of new methods for producing and selecting agronomically important quantitative and qualitative traits, (d) identification of plant characteristics or genes which are important targets for genetic manipulation, and (e) genetic studies on the alteration and utilization of unadapted and wild germplasm using new and novel approaches.

Competitive Research Grants Program
Plant Science - Genetic Mechanisms

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California Davis, CA 95616	Patrick E. McGuire	90-37140-5256 9001229	\$111,000	07/01/90 06/30/93	Utilization for Wheat of Alien Sources of Resistance to Barley Yellow Dwarf
University of California Davis, CA 95616	Carlos F. Quiros	90-37140-5425 9000973	\$97,000	09/01/90 08/31/92	Brassica Genome Evolution
Iowa State University of Science and Technology Ames, IA 50011	Donald S. Robertson	89-37140-4335 9003119	\$87,000	05/01/89 04/30/91	Isolation of Genes for Quantitative Inheritance in Maize

Competitive Research Grants Program
Plant Science - Genetic Mechanisms

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Iowa State University of Science and Technology Ames, IA 50011	Arnel R. Hallauer	90-37140-5578 9001019	\$105,830	09/15/90 09/30/94	Selection Methods for Germplasm Enhancement in Corn
USDA/ARS Mid-West Area Peoria, IL 61604	Roger P. Wise	90-37140-5235 9001136	\$63,000	07/01/90 06/30/92	Molecular Cloning of the RF2 Nuclear Restorer of T- Cytoplasm Male- Sterile Maize
USDA/ARS Mid-West Area Peoria, IL 61604	Edward H. Coe	90-37140-5236 9001089	\$141,000	07/01/90 06/30/93	Predicting Effects of Chromosome Segment Substitutions through Dosage Analysis

Competitive Research Grants Program
Plant Science - Genetic Mechanisms

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
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Michigan State University East Lansing, MI 48824	Shauna C. Somerville	90-37140-5775 9001039	\$66,000	09/15/90 09/30/92	A Gene Controlling the Reaction of Arabidopsis to the Black Rot Disease
Michigan State University East Lansing, MI 48824	Pamela J. Green	S90-37262-5585* 9001167	\$40,000*	09/01/90 08/31/93	Control of mRNA Stability in Dicotyledonous Plants
North Carolina State University Raleigh, NC 27695-7003	Harold T. Stalker	90-37140-5424 9001040	\$5,000	09/01/90 08/31/91	Symposium on Plant Breeding in the 1990's

* Grant split-funded with Biotechnology-Plant Molecular Biology area where the actual count is included. Total amount awarded \$153,000.

Competitive Research Grants Program
Plant Science - Genetic Mechanisms

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Nebraska Lincoln, NE 68583-0704	P. S. Baenziger	90-37140-5426 9001107	\$145,000	08/01/90 07/31/93	Exploring the Interface of Qualitative and Quantitative Variation
University of New Hampshire Durham, NH 03824	Anita S. Klein	90-37140-5306 9001069	\$97,000	09/15/90 09/30/92	Transposable Elements in Maize: Control of Gene Expression
Boyce Thompson Institute for Plant Research, Inc. Ithaca, NY 14853	David B. Stern	90-37140-5197 9000633	\$5,295	06/01/90 05/31/91	The Fourth International Workshop on Plant Mitochondria

Competitive Research Grants Program
Plant Science - Genetic Mechanisms

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
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Michigan State University East Lansing, MI 48824	Shauna C. Somerville	90-37140-5775 9001039	\$66,000	09/15/90 09/30/92	A Gene Controlling the Reaction of Arabidopsis to the Black Rot Disease
Michigan State University East Lansing, MI 48824	Pamela J. Green	S90-37262-5585* 9001167	\$40,000*	09/01/90 08/31/93	Control of mRNA Stability in Dicotyledonous Plants
North Carolina State University Raleigh, NC 27695-7003	Harold T. Stalker	90-37140-5424 9001040	\$5,000	09/01/90 08/31/91	Symposium on Plant Breeding in the 1990's

* Grant split-funded with Biotechnology-Plant Molecular Biology area where the actual count is included. Total amount awarded \$153,000.

PLANT SCIENCE
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NITROGEN FIXATION/METABOLISM

Grants in this area support research which will improve our understanding of how nitrogen is fixed, metabolized, and cycled. Since the availability of nitrogen is one of the most common limiting factors in crop production and because of problems associated with use of nitrogen fertilizers, some of the goals of the program are to provide the knowledge of basic mechanisms necessary for field and bioengineering applications such as increasing the efficiency of field nitrogen fixation and developing novel nitrogen fixing associations.

Areas supported by the program include, but are not limited to: chemistry of nitrogen fixation, factors limiting nitrogen fixation, plant-microbe interactions, ecology of nitrogen-fixing bacteria, nitrification and denitrification and nitrogen metabolism in higher plants.

Competitive Research Grants Program
Plant Science - Nitrogen Fixation Metabolism

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California Berkeley, CA 94720	John B. Neillands	88-37120-3889 9003251	\$55,000	09/01/88 08/31/91	Structure and Biology of Rhizobactin 1021
University of California Davis, CA 95616	John C. Meeks	90-37120-5602 9002522	\$100,000	09/01/90 08/31/92	Physiology and Genetics of Diazotrophic Symbiotic Cyanobacterial Associations
Yale University New Haven, CT 06520-7425	Dwight D. Baker	90-37120-5603 9001798	\$90,000	09/15/90 09/30/92	Assessing 15N- dilution Methodology for Estimating Nitrogen Fixation in Trees

Competitive Research Grants Program
Plant Science - Nitrogen Fixation Metabolism

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
USDA/ARS South Atlantic Area Athens, GA 30613	Paul E. Bishop	88-37120-3872 9001942	\$100,000	09/15/88 09/30/92	Genetic Regulation of Alternative N ₂ Fixation Systems in Azotobacter vinelandii
Northwestern University Evanston, IL 60201	Brian M. Hoffman	90-37120-5604 9001616	\$50,000	09/01/90 08/31/91	Single Crystal and Solution ENDOR Studies of Nitrogenase
Michigan State University East Lansing, MI 48824	Frank B. Dazzo	90-37120-5554 9002011	\$100,000	08/01/90 07/31/92	Root Hair Deforming and Nodule Initiating Factors from Rhizobium trifolii

Competitive Research Grants Program
Plant Science - Nitrogen Fixation Metabolism

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Missouri* Columbia, MO 65211	Steven G. Pueppke	S90-37262-5780* 9001832	\$45,000*	09/15/90 09/30/92	Symbiotic Mutants of Rhizobium fredii USDA257
Cornell University Ithaca, NY 14853	Stephen H. Zinder	90-37120-5605 9002022	\$100,000	09/15/90 09/30/92	Nitrogenase in a Methanogenic Archaeobacterium
Boyce Thompson Institute for Plant Research, Inc. Ithaca, NY 14853	Thomas A. LaRue	90-37120-5606 9001978	\$100,000	09/01/90 08/31/92	Phytohormones in Nodule Formation

* Grant split-funded with Biotechnology-Plant Molecular Biology area where the actual count is included. Total amount awarded \$100,000.

Competitive Research Grants Program
Plant Science - Nitrogen Fixation Metabolism

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Ohio State University Research Foundation Columbus, OH 43212	John G. Streeter	89-37120-4750 9002018	\$100,000	09/01/89 08/31/92	A Possible Mechanism for the Regulation of Gas Diffusion in Legume Nodules
Oregon State University Corvallis, OR 97331	Daniel J. Arp	88-37120-4200 9001992	\$100,000	03/15/90 09/30/92	Nitrification: Investigations of Ammonia Monooxygenase
Texas A&M Research Foundation College Station, TX 77843	K. A. VandenBosch	89-37120-4785 9003224	\$60,000	09/01/89 08/31/91	Secretion of Two Symbiosis-related Proteins by Legume Roots

Competitive Research Grants Program
Plant Science - Nitrogen Fixation Metabolism

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Brigham Young University Provo, UT 84602	Gerald D. Watt	90-37120-5607 9001941	\$100,000	09/01/90 08/31/92	The Mechanism of Nitrogenase Catalysis
Washington State University Pullman, WA 99164-1030	Michael L. Kahn	88-37120-3890 9002384	\$100,000	09/01/88 08/31/92	Amino Acid Metabolism in Alfalfa Root Nodules
Marquette University Milwaukee, WI 53233	Kenneth D. Noel	90-37120-5755 9002019	\$100,000	09/01/90 08/31/92	Symbiotic Physiology of Rhizobium Leguminosarum Lipopolysaccharide

TOTAL : \$ 1,300,000

PLANT SCIENCE
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PHOTOSYNTHESIS

Photosynthesis, a unique process involving a complex series of reactions, uses solar energy for splitting water into oxygen and protons and for synthesis of energy-rich molecules required for the growth of all organisms. Awards in this program support research on photosynthetic mechanisms, the associated steps in carbon metabolism, and the regulation of these processes. Toward expanding our knowledge of the fundamental aspects of photosynthesis and how its efficiency might be improved in crop plants, research sponsored by this program include studies on primary events during light absorption and extend to analyses of crop productivity. Thus, proposals that are considered for support include those concerning mechanisms of solar energy capture and transduction; structure, synthesis and turnover of the photosynthetic apparatus; the biochemistry of carbon dioxide fixation; translocation and partitioning of photosynthates; biogenesis of chloroplasts and the interactions of nuclear and chloroplast genes.

Competitive Research Grants Program
Plant Science - Photosynthesis

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Alaska Fairbanks, AK 99701	F. Gerald Plumley	90-37130-5574 9000640	\$100,000	09/15/90 09/30/92	Organization of Photosynthetic Membranes -- Protein: Protein Interactions
University of Colorado Boulder, CO 80309	Barbara Demmig-Adams	90-37130-5422 9000753	\$100,000	08/01/90 07/31/92	Carotenoids and Photoprotection in Various Crop Species
Yale University New Haven, CT 06520-7425	Gary W. Brudvig	90-37130-5575 9000727	\$100,000	09/01/90 08/31/92	Bioinorganic Chemistry in Mn Related to Photosynthetic Oxygen Evolution

Competitive Research Grants Program
Plant Science - Photosynthesis

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
National Academy of Sciences Washington, DC 20418	Glenn E. Schweitzer	90-37130-5800 9000746	\$6,000	09/01/90 03/31/91	US USSR Symposium on Photosynthesis Related Processes
University of Florida Gainesville, FL 32611	George E. Bowes	90-37130-5576 9000901	\$50,000	09/01/90 08/31/91	CO2 Concentrating Mechanisms in Photosynthesis
Florida State University Tallahassee, FL 32306	Peter H. Homann	90-37130-5613 9000981	\$100,000	08/15/90 08/31/92	Anion Actions in the Photosynthesis Water Oxidizing Complex

Competitive Research Grants Program
Plant Science - Photosynthesis

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE

University of Georgia Research Foundation, Inc. Athens, GA 30602	Gregory W. Schmidt	90-37130-5571 9003253	\$50,000	08/01/90 07/31/91	Pigment Binding of Light-Harvesting Complexes
USDA/ARS Mid-West Area Peoria, IL 61604	C. J. Whitmarsh	88-37130-3366 9001001	\$100,000	08/01/88 07/31/92	Electron Transfer and Proton Translocation Mechanisms in Photosynthetic Membranes
USDA/ARS Mid-West Area Peoria, IL 61604	Daniel R. Bush	90-37130-5423 9000750	\$50,000	08/01/90 07/31/91	The Proton-Sucrose Symport

Competitive Research Grants Program
Plant Science - Photosynthesis

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Michigan Ann Arbor, MI 48109	Charles F. Yocum	88-37130-3546 9000942	\$100,000	09/15/88 09/30/92	Inorganic Biochemistry of Photosynthetic Oxygen Evolution
Rutgers, The State University* Piscataway, NJ 08855-1089	Gerald A. Berkowitz	S90-37262-5586* 9000853	\$50,000*	09/01/90 08/31/92	Model of Chloroplast Envelope Components which Regulate H+ and K+ Transport
Cornell University* Ithaca, NY 14853	Robert Turgeon	S90-37262-5587* 9000854	\$33,986*	09/01/90 08/31/92	Phloem Loading in Coleus blumei and Cucurbita pepo

*Grant split-funded with Biotechnology - Plant Molecular Biology area where the actual count is included.
Total amount awarded \$100,000 respectively.

Competitive Research Grants Program
Plant Science - Photosynthesis

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Rochester Rochester, NY 14627	Robert S. Knox	90-37130-5641 9000803	\$100,000	08/01/90 07/31/92	Time - Resolved Fluorescence Studies of Antenna Function
Gordon Res. Conference Kingston, RI 02881	William A. Cramer	90-37130-5126 9000327	\$11,000	05/15/90 11/30/90	Gordon Conference on Biochemical Aspects of Photosynthesis
Gordon Res. Conference Kingston, RI 02881	Richard G. Jensen	90-37130-5133 9000629	\$4,650	06/01/90 11/30/90	CO2 Fixation in Green Plants - Gordon Research Conferences

Competitive Research Grants Program
Plant Science - Photosynthesis

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Texas Health Science Center Houston, TX 78712	Samuel Kaplan	90-37130-5774 9003692	\$80,000	09/15/90 09/30/91	Synthetic Deoxyoligonucleotide- Directed Analysis of Gene Control in Photosynthesis
Medical College of Wisconsin, Inc. Milwaukee, WI 53226	Henry M. Mizioroko	90-37130-5577 9003257	\$70,000	09/01/90 08/31/91	Regulated Enzymes in CO2 Fixation: Mechanisms of Activation and Catalysis

TOTAL : \$ 1,105,636

PLANT SCIENCE
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SOYBEAN RESEARCH

The overall goal of this program area is to support long-term, basic biological research on soybeans that can generate new ideas, new knowledge, and innovative technologies which ultimately will contribute to increased productivity and quality of the soybean crop. This program encourages innovative studies on: (1) physiology, genetics, and biochemistry of soybeans, (2) the mechanisms of interactions between soybean and its pests, and (3) the Rhizobium-soybean symbiosis.

Proposals on soybean research were submitted to appropriate plant science programs for review according to the scientific content of the proposal. The grants listed below were selected from those proposals deemed highly meritorious by appropriate review panels.

Additional research grants using soybean as an experimental system can be found in other plant science and biotechnology programs.

Competitive Research Grants Program
Plant Science - Soybean Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Iowa State University of Science and Technology Ames, IA 50011	Renee Kosslak	90-37231-5614 9002431	\$100,000	09/15/90 09/30/92	Effect of Soybean Genotypes on Root Isoflavones and Nodulation by B. japonicum
University of Illinois Champaign, IL 61820	Theodore Hymowitz	88-37231-4100 9000967	\$119,000	09/01/88 08/31/92	Genomic Relationships in the Genus Glycine Willd
University of Illinois* Champaign, IL 61820	Lila O. Vodkin	90-37231-5441* 9001775	\$100,000*	08/01/90 07/31/93	Developmental and Genetic Control of a Soybean Hydroxyproline-Rich Protein

* Grant split-funded with Biotechnology-Plant Growth and Development area. Total amount awarded \$110,000.

Competitive Research Grants Program
Plant Science - Soybean Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
USDA/ARS Beltsville Area* Beltsville, MD 20705	Peter van Berkum	90-37231-5608* 9001931	\$62,676*	09/15/90 09/30/92	Host Influence on Hydrogen Oxidation in Soybean Symbioses
North Carolina State University** Raleigh, NC 27695-7003	Gail G. Wilkerson	90-37231-5558** 9000984	\$80,000**	08/01/90 07/31/92	Cultural and Genetic Factors Affecting Soybean and Weed Competition for Light

TOTAL : \$ 461,676

* Grant split-funded with Biotechnology-Plant Molecular Biology area. Total amount awarded \$91,376.

** Grant split-funded with Biological Stress-Plant Pathology/Weed Science area. Total amount awarded \$90,000.

PLANT SCIENCE

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ALCOHOL FUELS

This program supports research activities related to the physiological, microbiological, biochemical, and genetic processes controlling the biological conversion of agriculturally important biomass material to alcohol fuels and industrial hydrocarbons. Studies on factors which limit efficiency of biological production of alcohol fuels and means of overcoming these limitations are also encouraged.

Competitive Research Grants Program
Plant Science - Alcohol Fuels

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Florida Gainesville, FL 32611	Lonnie O. Ingram	90-37233-5372 9001495	\$120,000	09/01/90 08/31/93	Genetic Engineering of Bacteria for Ethanol Production
Purdue Research Fdn. West Lafayette, IN 47907	George T. Tsao	90-37233-5388 9002823	\$120,318	09/01/90 08/31/92	Indirect Conversion on Xylose to Ethanol Involving Inorganic Catalysts
Purdue Research Fdn. West Lafayette, IN 47907	Michael R. Ladisch	90-37233-5410 9002878	\$110,000	09/01/90 08/31/92	Fermentable Sugars from Pretreated Cellulose

Competitive Research Grants Program
Plant Science - Alcohol Fuels

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Dartmouth College Hanover, NH 03755	Lee R. Lynd	90-37233-5615 9002902	\$130,318	09/01/90 08/31/92	Maximizing Thermophilic Alcohol Yields: A Metabolic Approach

TOTAL : \$ 480,636

BIOTECHNOLOGY

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It is widely acknowledged that biotechnological research offers direct access to new, potentially valuable high technology opportunities for agriculture and food production. Recent discoveries in molecular genetics and their successful applications show that "high technology in biology" is applicable to agriculture, and they contribute significantly to "the molecular revolution" that is basic to many of our industries. The new biotechnological research capabilities -- particularly those that build on advances in molecular biology -- have particular advantages for agriculture. They provide a new basis for changing plant and animal productivity and performance on the basis of the directed modification of specified genes and gene systems.

This new capability offers exceptional promise, but it cannot be effective unless it is closely integrated with basic science disciplines such as genetics, biochemistry, physiology, taxonomy, ecology, and key agriculture disciplines such as plant and animal breeding, agronomy, horticulture, plant pathology, and entomology. In recognizing these needs, the overall goal of the Biotechnology Program is to support research

aimed at establishing a thorough understanding of fundamental biological processes in animals, plants, and associated microorganisms that may provide the basic scientific knowledge needed for the development and application of the new biotechnological research capability to agriculture and food.

Three research areas are emphasized: (1) molecular genetics (2) molecular and cellular mechanisms of growth and development, and (3) molecular and cellular mechanisms controlling responses to environmental and biological stress.

BIOTECHNOLOGY
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PLANT MOLECULAR BIOLOGY

The primary objective of the sub-area, plant molecular biology, is to increase our understanding of the structure, function, regulation, and expression of genes of plants or plant pathogens. This program area emphasizes the following categories of research: (1) identification, isolation, and characterization of genes and gene products, (2) relationships between gene structure and function, (3) regulatory mechanisms of gene expression, (4) interactions between nuclear and organellar genes, and between extrachromosomal and chromosomal genes, (5) mechanisms of gene recombination and transposition, and (6) molecular basis of chromosomal replication (7) genetic mechanisms of interactions between beneficial and deleterious organisms and plant pathogens or weeds.

The proposals under the Biotechnology/Plant Molecular Biology area were submitted to one of the four plant science review panels according to the biological problem being addressed.

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Arizona Tucson, AZ 85721	Hans D. VanEtten	90-37262-5292 9000910	\$50,000	07/01/90 06/30/91	Pathogenicity Genes on Dispensable Chromosomes
University of California Berkeley, CA 94720	Patricia Zambryski	90-37262-5291 9001018	\$113,000	08/01/90 07/31/92	Analysis of VirA/ VirG Regulatory System in Agrobacterium
University of California Berkeley, CA 94720	Thomas J. Morris	90-37262-5295 9003226	\$75,000	09/01/90 08/31/91	Molecular Structure and Function of Carmovirus Genomes

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California Berkeley, CA 94720	Wilhelm Gruissem	90-37262-5412 9001048	\$70,000	08/01/90 07/31/91	Regulation of Tomato Fruit Development and Differentiation by HMG CoA Reductase
University of California Berkeley, CA 94720	Brian J. Staskawicz	90-37262-5443 9000788	\$110,000	08/01/90 07/31/92	Gene-for-Gene Interactions Specifying Disease Resistance in Tomato
University of California Berkeley, CA 94720	N. J. Panopoulos	90-37262-5518 9000616	\$110,000	09/01/90 08/31/92	Regulation of Pseudomonas Syringae Pathogenicity Genes

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California Berkeley, CA 94720	Andrew O. Jackson	90-37262-5533 9000666	\$100,000	09/01/90 08/31/92	Elements in Multiplication of Barley Stripe Mosaic Virus
University of California Davis, CA 95616	Kjell Andersen	88-37262-3385 9003168	\$70,000	06/01/88 05/31/91	Protein Engineering of A. eutrophus RuBP Carboxylase
University of California Davis, CA 95616	Raymond L. Rodriguez	88-37262-4019 9001109	\$40,000	08/15/88 08/31/91	The Molecular Biology of the Rice- Amylase Genes

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California Davis, CA 95616	John I. Yoder	90-37262-5322 9001150	\$139,000	09/01/90 08/31/92	Transposon Mutagenesis in Tomato: Developmental Timing Considerations
University of California Davis, CA 95616	Bryce W. Falk	90-37262-5323 9000914	\$90,000	07/01/90 06/30/92	Characterization of Maize Stripe Virus Infections of Plant and Insect Hosts
University of California Davis, CA 95616	Robert M. Learned	90-37262-5660 9001143	\$78,000	09/15/90 09/30/92	Localization and Targeting of HMG CoA Reductase in Arabidopsis Thaliana

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California Los Angeles, CA 90024-1406	J. Philip Thornber	88-37262-3557 9000770	\$100,000	07/01/88 06/30/92	The Light-Harvesting Complex of Photosystem I (LHC I)
University of California Los Angeles, CA 90024-1406	Robert B. Goldberg	89-37262-4524 9002870	\$39,375	07/01/89 06/30/91	Regulation of Soybean Seed Protein Gene Expression
University of California Riverside, CA 92521	William O. Dawson	90-37262-5296 9000695	\$60,000	07/01/90 06/30/91	Host Range Determinants of Tobamoviruses

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California Riverside, CA 92521	William O. Dawson	90-37262-5384 9003405	\$75,000	07/01/90 06/30/91	Sequence-Function Relationship of the TMV-Host Interaction
Connecticut Agricultural Experiment Station New Haven, CT 06504	Richard B. Peterson	90-37262-5609 9000663	\$113,986	09/01/90 08/31/92	Inhibition of Photosynthesis by O ₂ as Probed by CO ₂ Exchange and Optical Methods
University of Florida Gainesville, FL 32611	L. Curtis Hannah	90-37262-5638 9001156	\$180,000	09/01/90 08/31/93	Molecular Characterization of Sucrose Synthase Genes of Maize

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Florida Gainesville, FL 32611	Harold C. Kistler	90-37262-5651 9000700	\$100,000	09/01/90 08/31/92	Chromosome Structure of Plant Pathogenic Fungi
University of Georgia Research Foundation, Inc. Athens, GA 30602	Richard B. Meagher	90-37262-5294 9001061	\$98,000	09/15/90 09/30/92	Molecular Genetics of De Novo Purine Biosynthesis in Higher Plants
University of Georgia Research Foundation, Inc. Athens, GA 30602	Glenn A. Galau	90-37262-5639 9001110	\$97,000	09/01/90 08/31/92	Regulatory Elements Active During Later Seed Development

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Iowa State University of Science and Technology Ames, IA 50011	Charlotte R. Bronson	90-37262-5308 9000916	\$100,000	07/01/90 06/30/92	The Genetic Control of Pathogenicity in Cochliobolus Heterostrophus
University of Illinois* Champaign, IL 61820	Stephen K. Farrand	S90-37151-5434* 9000688	\$44,000*	08/01/90 07/31/92	Cis and Trans Acting Functions Mediating Ti Plasmid Transfer
Northern Illinois University DeKalb, IL 60115-2874	Jozef J. Bujarski	90-37262-5418 9000928	\$100,000	08/01/90 07/31/92	Genetic Information in Bromoviruses and its Relationship to Viral Pathogenicity

* Grant split-funded with Biological Stress-Plant Pathology/Weed Science area where the actual count is included. Total amount awarded \$100,000.

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
USDA/ARS Mid-West Area Peoria, IL 61604	Thomas M. Hohn	90-37262-5444 9001054	\$97,000	09/01/90 08/31/92	Introduction of a Foreign Sesquiterpene Cyclase Gene into Tobacco
University of Illinois Urbana, IL 61801	Colin A. Wraight	89-37262-4462 9003435	\$50,000	06/15/89 06/30/91	Molecular Biochemistry of Herbicide Resistance
Purdue Research Fdn. West Lafayette, IN 47907	Richard M. Lister	90-37262-5374 9000864	\$80,000	09/01/90 08/31/92	Genomic Structure and Function in Barley Yellow Dwarf Luteoviruses

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Purdue Research Fdn. West Lafayette, IN 47907	Robert M. Hanau	90-37262-5445 9000869	\$80,000	08/01/90 07/31/92	Molecular Genetics of Conidiation in Colletotrichum graminicola
Purdue Research Fdn. West Lafayette, IN 47907	Sally A. MacKenzie	90-37262-5652 9001122	\$95,000	09/01/90 08/31/92	Nuclear - mitochondria Interaction in Common Bean (Phaseolus vulgaris L.)
Kansas State University Manhattan, KS 66506	Frank F. White	90-37262-5278 9000998	\$100,000	07/01/90 06/30/92	Molecular Analysis of an avr Gene from Xanthomonas Campestris pv. Oryzae

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Kansas State University Manhattan, KS 66506	Scot H. Hulbert	90-37262-5446 9000686	\$58,000	08/01/90 07/31/91	Analysis of the Rpl Locus of Maize
University of Kentucky Research Foundation Lexington, KY 40506-0057	Robert J. Shepherd	90-37262-5307 9000964	\$110,000	09/01/90 08/31/92	Defining and Mapping the Genes of Caulimoviruses
University of Kentucky Research Foundation Lexington, KY 40506-0057	C. L. Schardl	90-37262-5447 9000751	\$90,000	07/01/90 06/30/92	Molecular Biology of Photoalexin Detoxification by Fusarium solani phaseoli

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Kentucky Research Foundation Lexington, KY 40506-0057	John G. Shaw	90-37262-5519 9000963	\$110,000	09/01/90 08/31/92	Viral Gene Expression in Potyvirus Infections
USDA/ARS Beltsville Area Beltsville, MD 20705	Benjamin F. Matthews	90-37262-5407 9001024	\$92,000	09/01/90 08/31/92	Cloning and Expression of Genes Involved in Amino Acid Biosynthesis
USDA/ARS Beltsville Area* Beltsville, MD 20705	Peter van Berkum	S90-37231-5608* 9001931	\$28,700*	09/15/90 09/30/91	Host Influence on Hydrogen Oxidation in Soybean Symbioses

* Grant split-funded with Plant Science-Soybean Research area where the actual count is included. Total amount awarded \$91,376.

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Michigan Ann Arbor, MI 48109	Eran Pichersky	90-37262-5448 9000729	\$100,000	08/01/90 07/31/92	Structure and Function of Chlorophyll a/b- binding Polypeptides
Michigan State University East Lansing, MI 48824	Pamela J. Green	90-37262-5585* 9001167	\$113,000*	09/01/90 08/31/93	Control of mRNA Stability in Dicotyledonous Plants
Michigan State University East Lansing, MI 48824	Gerald T. Babcock	90-37262-5701 9000861	\$100,000	09/01/90 08/31/92	Charge Separation and Stabilization in Chloroplast Photosystem II

* Grant split-funded with Plant Science-Genetic Mechanisms area. Total amount awarded \$153,000.

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Michigan State University East Lansing, MI 48824	Frans J. de Bruijn	90-37263-5781 9001934	\$100,000	09/15/90 09/30/92	Cis & Trans-acting Elements/Factors in Nodulin Gene Regulation
University of Minnesota St. Paul, MN 55104	Neil E. Olszewski	90-37262-5373 9001000	\$90,000	07/01/90 06/30/92	Molecular Genetics of the BADNAVIRUSES
University of Minnesota St. Paul, MN 55104	Paul A. Lefebvre	90-37262-5759 9001988	\$80,000	09/01/90 08/31/92	The Regulation of Nitrate Reductase Expression in Chlamydomonas

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Missouri Columbia, MO 65211	William R. Folk	88-37262-4113 9001162	\$97,000	09/15/88 09/30/92	Expression of Plant tRNA Genes
University of Missouri* Columbia, MO 65211	Steven G. Pueppke	90-37262-5780* 9001832	\$55,000*	09/15/90 09/30/92	Symbiotic Mutants of Rhizobium fredii USDA257
Washington University St. Louis, MO 63110	John C. Rogers	90-37262-5350 9001080	\$97,000	08/01/90 07/31/92	Regulation of Gene Expression in Barley Aleurone Cells

* Grant split-funded with Plant Science-Nitrogen Fixation Metabolism area. Total amount awarded \$100,000.

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
William R. Marcotte, Jr. Chapel Hill, NC 27516	William R. Marcotte	90-37262-5281 9001106	\$68,500	07/15/90 07/31/92	Analysis of Post Transcriptional Regulatory Mechanisms
University of Nebraska Lincoln, NE 68583-0704	Robert J. Spreitzer	89-37262-4457 9002852	\$86,000	06/01/89 05/31/91	Chloroplast Heteroplasmic Suppression
University of Nebraska Lincoln, NE 68583-0704	Paul E. Staswick	90-37262-5532 9001111	\$102,000	07/01/90 06/30/92	Molecular Control of Soybean Vegetative Storage Protein Gene Expression

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Rutgers, The State University* Piscataway, NJ 08855-1089	Gerald A. Berkowitz	90-37262-5586* 9000853	\$50,000*	09/01/90 08/31/92	Model of Chloroplast Envelope Components which Regulate H+ and K+ Transport
Cornell University Ithaca, NY 14853	June B. Nasrallah	89-37262-4458 9003392	\$85,000	09/01/89 08/31/91	Molecular Analysis of the Cellular Interactions of Incompatibility in Brassica
Boyce Thompson Institute for Plant Research, Inc. Ithaca, NY 14853	Norman F. Weeden	89-37262-4739 9003399	\$45,000	09/01/89 08/31/91	Analysis and Cloning of Symbiosis Genes in Pisum

* Grant split-funded with Photosynthesis area. Total amount awarded \$100,000.

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Cornell University Ithaca, NY 14853	Elizabeth D. Earle	90-37262-5280 9001161	\$93,000	09/15/90 09/30/92	Sorting of Tomato Chromosomes for Construction of Chromosome- Specific Libraries
Cornell University Ithaca, NY 14853	Milton Zaitlin	90-37262-5293 9000821	\$120,000	07/01/90 06/30/92	Mechanism of Action of a Viral-Induced Resistance of Transformed Plants
Cornell University* Ithaca, NY 14853	Robert Turgeon	90-37262-5587* 9000854	\$66,014*	09/01/90 08/31/92	Phloem Loading in Coleus blumei and Cucurbita pepo

* Grant split-funded with Photosynthesis area. Total amount awarded \$100,000.

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Cornell University Ithaca, NY 14853	Olen C. Yoder	90-37262-5240 9003195	\$55,000	07/01/90 06/30/91	Altered Virulence and Specificity in Recombinant Fungal Pathogens
Cornell University Ithaca, NY 14853	Maureen R. Hanson	90-37262-5270 9001165	\$188,000	09/01/90 08/31/93	Analysis of Proteins and Transcripts Associated with Cytoplasmic Male Sterility
Cornell University Ithaca, NY 14853	Olen C. Yoder	90-37262-5279 9000929	\$90,000	07/01/90 06/30/92	Role of Enzymes in Fungal Pathogenesis: Analysis by Site Specific Mutation

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Boyce Thompson Institute for Plant Research, Inc. Ithaca, NY 14853	Stephen H. Howell	90-37262-5642 9003232	\$40,000	09/01/90 08/31/91	Viral Pathogenesis in Plants
Ohio University* Athens, OH 45701-2979	Allan M. Showalter	S90-37140-5499* 9001081	\$22,125*	09/01/90 08/31/92	Potato Lectin Gene(s): Structure, Evolution, and Expression
Ohio State University Research Foundation Columbus, OH 43212	David M. Bisaro	90-37262-5167 9001105	\$75,000	09/01/90 08/31/91	Molecular Mechanisms of Geminivirus Replication

* Grant split-funded with Plant Science-Genetic Mechanisms area where the actual count is included. Total amount awarded \$102,000.

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Ohio State University Research Foundation Columbus, OH 43212	David L. Coplin	90-37262-5389 9000875	\$100,000	09/01/90 08/31/92	Biochemical Genetics of Capsular Polysaccharide Synthesis in <i>Erwinia stewartii</i>
Oregon State University Corvallis, OR 97331	Lynda M. Ciuffetti	90-37262-5360 9000946	\$33,000	08/15/90 08/31/91	Molecular Cloning of a Pathogenicity Gene from <i>Pyrenophora tritici-repentis</i>
Oregon State University Corvallis, OR 97331	Theo W. Dreher	90-37262-5643 9003252	\$50,000	09/01/90 08/31/91	Studies on a Virus- encoded Subunit of Plant Viral Replicase

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Gordon Res. Conference Kingston, RI 02881	Richard B. Hallick	90-37262-5199 9000636	\$5,000	06/01/90 11/30/90	Gordon Research Conference, Mitochondrial and Chloroplast Biogenesis
University of Tennessee Knoxville, TN 37996-0140	Gary S. Stacey	88-37262-3894 9001796	\$100,000	09/01/88 08/31/92	Genetic Regulation of the Nodulation Genes of Bradyrhizobium japonicum
University of Texas Austin, TX 78712-1111	R. Malcolm Brown	90-37262-5520 9001071	\$105,000	08/01/90 07/31/92	Identification and Isolation of Genes for Cellulose Biosynthesis

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Texas A&M Research Foundation College Station, TX 77843	Neal K. Van Alfen	90-37262-5661 9003403	\$40,000	08/01/90 07/31/91	RNA Polymerase Associated with the dsRNA of Cryphonectria Parasitica
Virginia Polytechnic Institute and State University Blacksburg, VA 24061	John L. Johnson	88-37262-3774 9001972	\$100,000	08/01/88 07/31/92	Nitrogen Fixation (nif) Genes in Clostridium
Washington State University Pullman, WA 99164-1030	Thomas W. Okita	90-37262-5166 9001134	\$145,000	06/15/90 06/30/93	Development of in vitro Transcription Systems for both Monocot and Dicot Genes

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Washington State University Pullman, WA 99164-1030	Dennis C. Gross	90-37262-5297 9000736	\$90,000	08/15/90 08/31/92	Transcriptional Activation of Syringomycin Genes in Pseudomonas syringae
University of Wisconsin Madison, WI 53706	Richard D. Vierstra	88-37262-3368 9003233	\$80,000	07/01/88 06/30/91	Characterization of the Ubiquitin- Dependent Proteolytic Pathway in Plants
University of Wisconsin Madison, WI 53706	John L. Markley	88-37262-3406 9000845	\$100,000	05/15/88 05/31/92	Structure-Function Relationships in Photosynthetic Electron Transport

Competitive Research Grants Program
Biotechnology - Plant Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Wisconsin Madison, WI 53706	Timothy J. Donohue	90-37262-5588 9000766	\$100,000	09/01/90 08/31/92	Mutations Affecting Photosynthetic Cytochrome Synthesis
University of Wisconsin Madison, WI 53706	Paul W. Ludden	90-37262-5760 9002024	\$50,000	09/01/90 08/31/91	Characterization of Altered Forms of the Mo-Fe Protein of Nitrogenase

TOTAL : \$ 6,258,700

BIOTECHNOLOGY

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PLANT GROWTH AND DEVELOPMENT

The lack of information about the basic cellular and molecular processes involved in plant growth and development is considered a serious limiting step for realizing the full potential of biotechnology in agriculture. The goal of this program is to support fundamental research designed to fill in this gap in our knowledge. The program encourages the use of emerging experimental techniques and emphasizes: (1) cellular and molecular mechanisms controlling plant growth and development and (2) metabolic processes related to growth and development.

Competitive Research Grants Program
Biotechnology - Plant Growth & Development

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Arizona Tucson, AZ 85721	Karen K. Oishi	88-37261-3699 9001726	\$80,000	07/01/88 08/31/92	Expression of a Maize Vivipary Gene during Embryogenesis
University of Arizona Tucson, AZ 85721	Brian A. Larkins	89-37261-4790 9001831	\$80,000	09/01/89 08/31/91	Regulation for Protein Synthesis in Developing Oat Seeds
University of California Davis, CA 95616	J. Clark Lagarias	89-37261-4541 9003416	\$85,000	07/01/89 08/31/91	Phytochrome Chromophore Biosynthesis and Holoprotein Assembly

Competitive Research Grants Program
Biotechnology - Plant Growth & Development

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California Davis, CA 95616	Irwin H. Segel	90-37261-5484 9001526	\$200,000	09/01/90 08/31/93	The Sulfate Activating Enzymes of Higher Plants
University of California Davis, CA 95616	Shang Fa Yang	90-37261-5514 9001559	\$95,000	09/01/90 08/31/92	N-Malonyl-D- tryptophan: Synthesis, Compartmentation and Degradation
University of California Davis, CA 95616	John J. Harada	90-37261-5515 9001797	\$118,000	09/01/90 08/31/92	Peroxisome Biogenesis in Higher Plants

Competitive Research Grants Program
Biotechnology - Plant Growth & Development

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California, San Diego La Jolla, CA 92093	M. J. Chrispeels	89-37261-4686 9003201	\$65,000	09/01/89 08/31/91	Targeting and Function of a Tonoplast Protein
San Diego State University Foundation San Diego, CA 92182	Steven D. Clouse	90-37261-5700 9001877	\$70,000	09/01/90 08/31/92	Molecular Analysis of Brassinolide Action in Plant Growth and Development
University of California Santa Barbara, CA 93106	R. Christoffersen	90-37261-5658 9001789	\$121,000	09/01/90 08/31/92	Function and Regulation of the Cellulase and AVOe3 Genes

Competitive Research Grants Program
Biotechnology - Plant Growth & Development

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Georgia Research Foundation, Inc. Athens, GA 30602	Jan Marc	90-37261-5321 9001556	\$120,000	07/01/90 06/30/92	Plasma Membrane- Associated Cytoskeleton in Plant Cells
University of Illinois* Champaign, IL 61820	Lila O. Vodkin	S90-37231-5441* 9001775	\$10,000*	08/01/90 07/31/93	Developmental and Genetic Control of a Soybean Hydroxyproline-Rich Protein
USDA/ARS Mid-West Area Peoria, IL 61604	John Ralph	90-37261-5617 9001760	\$80,000	08/15/90 08/31/92	Structural and Functional Roles of Phenolic Acids in Developing Plant Cell Walls

* Grant split-funded with Plant Science-Soybean Research area where the actual count is included. Total amount awarded \$110,000.

Competitive Research Grants Program
Biotechnology - Plant Growth & Development

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Carleton College Northfield, MN 55057	Susan R. Singer	90-37261-5516 9001899	\$32,000	09/01/90 08/31/91	Regulation of Floral Development in Pisum sativum
University of Missouri Columbia, MO 65211	Douglas D. Randall	90-37261-5066 9001484	\$5,000	05/01/90 11/30/90	Symposium Series: Current Topics in Plant Biochemistry & Physiology
Washington University St. Louis, MO 63130	Ursula W. Goodenough	88-37261-3725 9001765	\$102,000	09/15/88 09/30/92	Hydroxyproline-Rich Glycoproteins: Sequences and Transcriptional Regulation

Competitive Research Grants Program
Biotechnology - Plant Growth & Development

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of North Carolina at Chapel Hill Chapel Hill, NC 27599-4100	Alan M. Jones	90-37261-5517 9001579	\$100,000	09/01/90 08/31/92	Phytochrome- regulated Growth
Duke University Durham, NC 27706	Michael C. Pirrung	90-37261-5650 9001766	\$175,000	09/01/90 08/31/93	Isolation and Study of the Ethylene- Forming Enzyme
North Carolina State University Raleigh, NC 27695-7003	Rebecca S. Boston	90-37261-5618 9001748	\$89,000	09/01/90 08/31/91	Regulation and Function of b-70, a Maize Homolog of BiP- GRP78

Competitive Research Grants Program
Biotechnology - Plant Growth & Development

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Nebraska Lincoln, NE 68588-0430	Thomas E. Elthon	90-37261-5416 9002002	\$104,000	08/01/90 07/31/93	Purification of the Mitochondrial Exogenous NADH Dehydrogenase Unique to Plants
Rutgers, The State University New Brunswick, NJ 08903	Ilya Raskin	90-37261-5659 9001584	\$150,000	09/01/90 08/31/92	Role of Endogenous Salicylic Acid in Local and Systemic Disease Resistance
Ohio State University Research Foundation Columbus, OH 43212	Thomas L. Sims	90-37261-5584 9001728	\$80,000	09/01/90 08/31/92	Molecular Analysis of S-Allele Function in Self-Incompatible and PSC Petunia

Competitive Research Grants Program
Biotechnology - Plant Growth & Development

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Oregon State University Corvallis, OR 97331	David L. Rayle	90-37261-5779 9001788	\$145,000	09/01/90 08/31/92	Molecular Dissection of Auxin Action Using an Auxin Receptor Mutant of Tomato
University of Oregon Eugene, OR 97403	Jeanne L. Selker	90-37261-5619 9001838	\$150,000	09/15/90 09/30/93	Pattern Formation in Plants
USDA/ARS North Atlantic Area Philadelphia, PA 19118	Leon V. Kochian	90-37261-5411 9001752	\$150,000	09/15/90 09/30/93	Cellular and Molecular Biology of a High-Affinity K ⁺ Transport System

Competitive Research Grants Program
Biotechnology - Plant Growth & Development

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Univ. of Pennsylvania Philadelphia, PA 19104	Richard S. Poethig	90-37261-5620 9001764	\$80,000	09/01/90 08/31/91	Genetic Analysis of Root Hair Development in Arabidopsis Thaliana
Pennsylvania State University University Park, PA 16802	Jack C. Shannon	90-37261-5277 9001480	\$4,000	07/01/90 01/31/91	Financial Support for the 5th Annual Penn State Symposium in Plant Physiology
Pennsylvania State University University Park, PA 16802	Teh-hui Kao	90-37261-5560 9001585	\$144,000	08/01/90 07/31/93	Cellular and Biochemical Basis of Gametophytic Self- Incompatibility

Competitive Research Grants Program
Biotechnology - Plant Growth & Development

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Gordon Res. Conference Kingston, RI 02881	M. J. Chrispeels	90-37261-5198 9000623	\$5,000	06/01/90 11/30/90	Plant Molecular Biology Gordon Conference: Cells and Signals
University of Tennessee Knoxville, TN 37996-0140	Daniel M. Roberts	88-37261-3521 9001790	\$131,000	07/01/88 06/30/92	Posttranslational Calmodulin Methylation in Normal and Transgenic Plants
Texas A&M Research Foundation College Station, TX 77843	Craig L. Nessler	90-37261-5375 9001524	\$90,000	09/01/90 08/31/92	Regulation of Cell Specific Gene Expression in Laticifer Cells

Competitive Research Grants Program
Biotechnology - Plant Growth & Development

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Wisconsin Madison, WI 53706	Michael R. Sussman	90-37261-5621 9001756	\$90,000	08/15/90 08/31/92	Calcium-Activated Protein Kinase and Rapid Growth Response of Plants

TOTAL : \$ 2,950,000

BIOTECHNOLOGY

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PLANT PEST SCIENCE--INSECTS AND NEMATODES (Response to Biological Stress)

The primary objective of the sub-area is to increase our understanding of the structure, function, regulation, expression, and inheritance of genes of insects, mites, nematodes and their associated microorganisms and control agents. Additionally, research is supported which will contribute to an understanding of insect, nematode or mite reproduction and development on a molecular or cellular level. The program area emphasizes, but is not restricted to: 1) identification and characterization of genes and gene products, 2) relationship between gene structure and function, 3) regulation of gene expression, 4) genetic mechanisms or interactions between beneficial and deleterious organisms and insects, mites, or nematodes, and 5) hormonal regulation of reproduction and development.

Competitive Research Grants Program
Biotechnology - Response to Biological Stress

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California Riverside, CA 92521	David M. Bird	89-37263-4355 9003193	\$60,000	07/01/89 06/30/91	Molecular Characterization of the Root-Knot Nematode Host Interaction
University of Florida Gainesville, FL 32611	Pauline O. Lawrence	90-37263-5562 9001300	\$100,000	08/01/90 07/31/92	A Parasitism - Specific Protein in the Caribbean Fruit Fly
USDA/ARS South Atlantic Area Athens, GA 30613	Alfred M. Handler	90-37263-5485 9001210	\$60,000	09/01/90 08/31/91	Gene-Transfer Vector Analysis in Insects of Economic Importance

Competitive Research Grants Program
Biotechnology - Response to Biological Stress

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Purdue Research Fdn. West Lafayette, IN 47907	Arthur I. Aronson	90-37263-5561 9001191	\$120,000	09/01/90 08/31/92	Mutagenic Analysis of a Bacillus thuringiensis Protoxin
Purdue Research Fdn.* West Lafayette, IN 47907	Larry L. Murdock	S90-37153-5439* 9001259	\$40,000*	09/01/90 08/31/92	Lectins as Plant Defenses Against Insects
Kansas State University Manhattan, KS 66506	William C. Black	90-37263-5361 9001470	\$150,000	07/15/90 07/31/93	A Recombinational Map of Virulence Genes in the Hessian Fly

*Grant split-funded with Entomology/Nematology area where the actual count is included.
Total amount awarded \$85,000.

Competitive Research Grants Program
Biotechnology - Response to Biological Stress

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Minnesota St. Paul, MN 55108	Ann M. Fallon	90-37263-5521 9001242	\$150,000	09/15/90 09/30/93	Molecular Approaches to Preservation of Insecticide Sensitivity
North Carolina State University Raleigh, NC 27695-7003	Russell J. Linderman	90-37263-5718 9001201	\$160,000	09/01/90 08/31/93	Specific Transition State Inhibitors of Juvenile Hormone Metabolic Enzymes
University of Nebraska Lincoln, NE 68583-0704	Thomas O. Powers	90-37263-5257 9001296	\$120,000	07/01/90 06/30/92	Enhanced Nematode Diagnostics by Polymerase Chain Reaction

Competitive Research Grants Program
Biotechnology - Response to Biological Stress

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Boyce Thompson Institute for Plant Research, Inc. Ithaca, NY 14853	Donald W. Roberts	89-37263-4463 9003427	\$50,000	07/01/89 06/30/91	Genes for Cuticle Penetration Enzymes of an Entomopathogenic Fungus
Cornell University Ithaca, NY 14853	Jeffrey G. Scott	90-37263-5282 9001168	\$100,000	07/01/90 06/30/92	Characterization of an Insecticide Resistance-Related Cytochrome P450
Oregon State University Corvallis, OR 97331	George F. Rohrmann	90-37263-5622 9001266	\$110,000	09/01/90 08/31/92	Identification and Characterization of Baculovirus Gene Translation Products

Competitive Research Grants Program
Biotechnology - Response to Biological Stress

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Tennessee Knoxville, TN 37901-1071	Larry C. Waters	90-37263-5761 9003699	\$100,000	09/15/90 09/30/92	Molecular Biology of Cytochrome P450 Related Insecticide Resistance
Texas A&M Research Foundation College Station, TX 77843	Jo-Ann G. W. Fleming	90-37263-5563 9000972	\$120,000	09/15/90 09/30/92	Integrated Polydnavirus DNA in a Parasitoid Wasp Genome: Structural Analysis
University of Wisconsin Madison, WI 53706	Michael R. Strand	89-37263-4426 9003395	\$50,000	07/01/89 06/30/91	The Role of Host Endocrine Factors in the Development of Polyembryonic Wasps

Competitive Research Grants Program
Biotechnology - Response to Biological Stress

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Wisconsin Madison, WI 53706	Walter G. Goodman	90-37263-5486 9001306	\$100,000	09/01/90 08/31/92	Biological Significance of Juvenile Hormone Transport Insect Hemolymph

TOTAL : \$ 1,590,000

BIOTECHNOLOGY
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RESPONSE TO PHYSICAL STRESS (Plants)

This program supports research on various physico-chemical factors (such as chilling, heavy metals, water stress, etc.) which prevent the expression of the full genetic potential of a plant. The major goals are to understand the molecular basis for response to the various stresses and to identify those genetic systems causing the responses which can be manipulated by biotechnology techniques.

The program emphasizes: the identification, transfer, and expression of genes involved in the stress response or those likely to affect performance under stress; fundamental mechanisms of the stress response including injury, tolerance and avoidance at the molecular, cellular, and organismal level; mechanisms of the coordination of organismal response to stress; and laboratory and field investigations leading to an understanding of the causes, consequences, and avoidance of stress.

Competitive Research Grants Program
Biotechnology - Response to Physical Stress (Plants)

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Arizona Tucson, AZ 85721	Hans J. Bohnert	89-37264-4711 9003196	\$60,000	09/01/89 08/31/91	Regulation of Gene Expression During Salt Stress
University of California Riverside, CA 92521	Eugene A. Nothnagel	90-37264-5471 9002425	\$100,000	09/01/90 08/31/92	Membrane Role in Maize Genotype Chilling Sensitivity
Colorado State University Fort Collins, CO 80523	Cecil Stushnoff	90-37264-5564 9002419	\$105,000	09/01/90 08/31/92	Biochemistry of Products that Confer Resistance to Desiccation and Freezing in Buds

Competitive Research Grants Program
Biotechnology - Response to Physical Stress (Plants)

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Purdue Research Fdn. West Lafayette, IN 47907	Peter B. Goldsbrough	90-37264-5449 9002488	\$110,000	09/01/90 08/31/92	Molecular and Genetic Characterization of Cadmium Tolerance in Plants
Purdue Research Fdn. West Lafayette, IN 47907	Edward N. Ashworth	90-37264-5702 9002620	\$100,000	09/01/90 08/31/92	The Reponse of Woody Plant Tissue to a Freezing Stress
Michigan State University East Lansing, MI 48824	Michael F. Thomashow	90-37264-5450 9002537	\$110,000	09/01/90 08/31/92	Regulation of Gene Expression in Response to Cold Temperatures

Competitive Research Grants Program
Biotechnology - Response to Physical Stress (Plants)

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Minnesota St. Paul, MN 55108	John V. Carter	90-37264-5565 9002038	\$110,000	08/01/90 07/31/92	Responses of Plant Microtubules to Low Temperature
Research Foundation of State University of New York Albany, NY 12201	Mary A. Bisson	90-37264-5522 9002541	\$100,000	09/15/90 09/30/92	Role of Ca ²⁺ in Detection of and Response to Salinity Induced Changes in Turgor
Carnegie Mellon Univ. Pittsburgh, PA 15213	Jonathan W. Jarvik	90-37264-5451 9002417	\$125,000	08/01/90 07/31/92	Glutathione and Phytochelatin Synthesis in Chlamydomonas

Competitive Research Grants Program
Biotechnology - Response to Physical Stress (Plants)

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE

Texas A&M Research Foundation College Station, TX 77843	Malcolm C. Drew	90-37264-5523 9002542	\$180,000	09/01/90 08/31/93	Metabolic Acclimation of Root Cells to Oxygen Deficiency

TOTAL : \$ 1,100,000

BIOTECHNOLOGY

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ANIMAL MOLECULAR BIOLOGY

The objective of the animal molecular biology program is to increase our knowledge and understanding of the structure, function, regulation and expression of genomes of animal, microbial and viral origin. This includes but is not limited to: the molecular biology of genes of cellular, organellar or animal origin; gene transfer and germline integration of exogenous genes; the molecular biology of replication and gene expression of bacteria, parasites, viruses and other infectious or non-infectious agents; structural immunology and immunogenetics; molecular genetics; and molecular endocrinology. Priorities are given to those studies that will yield fundamental information which may ultimately aid in improving the biological efficiency and disease resistance in domestic animals.

Competitive Research Grants Program
Biotechnology - Animal Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Auburn University Auburn University, AL 36849	Vicky L. van Santen	90-37266-5783 9001675	\$185,000	09/15/90 09/30/93	Structure and Function of the Immediate Early Genes of Bovine Herpesvirus-4
University of California, San Diego La Jolla, CA 92093	Lynette B. Corbeil	90-37266-5704 9001647	\$200,000	09/01/90 08/31/93	Bacterial "Fc" Receptor Genes and Virulence
Colorado State University Fort Collins, CO 80523	Jonathan O. Carlson	90-37266-5566 9001803	\$200,000	09/01/90 08/31/93	Lentiviral Genomic Variation During Infection

Competitive Research Grants Program
Biotechnology - Animal Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Iowa State University of Science and Technology Ames, IA 50011	Donald C. Beitz	90-37266-5785 9001806	\$210,000	09/15/90 09/30/93	Molecular Biology and Phenotypic Relationships to Bovine Mitochondrial DNA
University of Iowa Iowa City, IA 52242	Alan G. Goodridge	90-37266-5719 9001660	\$70,000	09/01/90 08/31/91	Regulation of Body Fat in Poultry
University of Illinois Urbana, IL 61801	Harris A. Lewin	89-37266-4568 9003437	\$120,000	09/01/89 08/31/91	Mapping and Polymorphism of Bovine Major Histocompatibility Complex Genes

Competitive Research Grants Program
Biotechnology - Animal Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Illinois Urbana, IL 61801	Richard E. Isaacson	90-37266-5784 9001678	\$210,000	09/15/90 09/30/92	Virulence Factors of Enterotoxigenic Escherichia coli
University of Massachusetts Amherst, MA 01003	F. A. Ponce de Leon	90-37266-5720 9001697	\$210,000	09/01/90 08/31/93	Physical Mapping of Chromosome 23 in the Bovine
Michigan State University East Lansing, MI 48824	Paul M. Coussens	88-37266-3983 9001840	\$200,000	07/15/88 07/31/92	Regulatory Regions of Marek's Disease Virus

Competitive Research Grants Program
Biotechnology - Animal Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Michigan State University East Lansing, MI 48824	Leland F. Velicer	90-37266-5589 9001880	\$220,000	09/01/90 08/31/92	Marek's Disease Herpesvirus: Membrane Glycoprotein Gene Analysis, a gD Homolog
Washington University St. Louis, MO 63130	Roy Curtiss	90-37266-5472 9001702	\$200,000	09/01/90 08/31/92	Analysis of Salmonella enteritidis Virulence in Chickens
Montana State University Bozeman, MT 59717	Mark A. Jutila	90-37266-5786 9001666	\$250,000	09/15/90 09/30/93	Characterization of Leucocyte Homing Receptors and Vascular Addressins in Livestock

Competitive Research Grants Program
Biotechnology - Animal Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Nevada Reno, NV 89557-0025	Stuart T. Nichol	90-37266-5473 9001683	\$270,000	09/15/90 09/30/93	Do Defective Interfering Particles Play a Role in RNA Virus Natural Infections and Evolution?
Texas A&M Research Foundation College Station, TX 77843	James E. Womack	90-37266-5590 9001709	\$250,000	09/01/90 08/31/93	Molecular and Somatic Cell Genetics: Mapping the Cattle Genome
Texas A&M Research Foundation College Station, TX 77843	Barbara L. Doughty	90-37266-5623 9001824	\$225,000	09/01/90 08/31/92	Analysis of the Bovine Cellular Immune Response to Antigens Isolated from Fasciola hepatica

Competitive Research Grants Program
Biotechnology - Animal Molecular Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Utah State University Logan, UT 84322	Joseph K. Li	90-37266-5567 9001619	\$220,000	09/15/90 09/30/93	Molecular Analyses of Antigenic Epitopes Critical for Bluetongue Virus Infection
University of Wisconsin Madison, WI 53706	Richard F. Marsh	90-37266-5591 9001618	\$185,000	09/15/90 09/30/92	Studies on the Origin and Etiology of Transmissible Mink Encephalopathy

TOTAL : \$ 3,425,000

BIOTECHNOLOGY

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ANIMAL GROWTH AND DEVELOPMENT

Research in animal growth and development contributes to a basic understanding of potential problems related to suboptimal growth and development in animals of domestic agricultural significance. The program emphasizes molecular and cellular biological approaches in a number of research areas including but not limited to: growth hormones, growth factors and other macromolecules which regulate muscle and skeletal growth; the transfer of exogenous genes to the germline of domestic animals and their subsequent expression, mammary gland biogenesis and development; the regulation of gene expression as it relates to developmental processes; and the developmental consequences of embryo transfer. Special attention is given to innovative projects of "high risk."

Competitive Research Grants Program
Biotechnology - Animal Growth & Development

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Arizona Tucson, AZ 85721	Darrel E. Goll	87-CRCR-1-2283 9003234	\$100,000	09/01/87 08/31/91	Proteases Responsible for Muscle Protein Degradation and their Role in Growth
University of California Davis, CA 95616	Jeffrey L. Stott	90-37265-5782 9000884	\$185,000	09/15/90 09/30/93	Phenotype, Function and Passive Transfer of Bovine Milk Lymphocytes
University of Illinois Champaign, IL 61820	Lawrence B. Schook	90-37265-5298 9000879	\$250,000	08/01/90 07/31/93	Mapping Major Genes for Growth and Reproductive Traits in Swine

Competitive Research Grants Program
Biotechnology - Animal Growth & Development

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Illinois Urbana, IL 61801	Keith W. Kelley	89-37265-4536 9003255	\$100,000	09/01/89 08/31/91	Endocrine Regulation of the Immune System
University of Illinois Urbana, IL 61801	Bryan A. White	90-37265-5610 9000744	\$125,000	09/01/90 08/31/92	Enzymatic and Genetic Analysis of Ruminococcus Cellulases
University of Missouri Columbia, MO 65211	Randall S. Prather	90-37265-5452 9000733	\$150,000	08/01/90 07/31/92	Nuclear Changes After Nuclear Transfer for Cloning Pigs

Competitive Research Grants Program
Biotechnology - Animal Growth & Development

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Rutgers, The State University Piscataway, NJ 08855-1089	Barry W. Jesse	90-37265-5453 9000812	\$120,000	08/01/90 07/31/93	Mechanism of Rumen Development and Growth
Rutgers, The State University Piscataway, NJ 08855-1089	Julie M. Fagan	90-37265-5454 9000778	\$125,000	09/01/90 08/31/93	Mechanisms of Protein Breakdown in Skeletal Muscle of the Chicken
Cornell University Ithaca, NY 14853	James A. Marsh	88-37265-3882 9001064	\$180,000	09/01/88 08/31/92	Endocrine Effects on Immune Development and Function in the Domestic Fowl

Competitive Research Grants Program
Biotechnology - Animal Growth & Development

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Syracuse University Syracuse, NY 13210	James R. Florini	90-37265-5487 9000716	\$130,000	09/01/90 08/31/92	Control of Myogenin Gene Expression by IGF-I
Pennsylvania State University University Park, PA 16802	Craig R. Baumrucker	90-37265-5455 9000679	\$220,000	09/01/90 08/31/92	IGF Binding Proteins in Bovine Mammary Cells: Synthesis and Biological Activity
Medical University of South Carolina Charleston, SC 29425	L. Stephen Frawley	90-37265-5488 9000720	\$170,000	08/01/90 07/31/92	Secretory Characteristics of Growth Hormone Cells in Cattle

Competitive Research Grants Program
Biotechnology - Animal Growth & Development

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Tennessee Knoxville, TN 37996-0140	David O. Slauson	90-37265-5611 9003454	\$120,000	09/15/90 09/30/92	Leukocyte Function and Host Defense in Developing Calves
University of Washington Seattle, WA 98195	LeBris S. Quinn	90-37265-5456 9000702	\$195,000	09/01/90 08/31/93	Bovine Double - Muscling: In Vitro Model of Myogenesis and Tissue Repartitioning
University of Wisconsin Madison, WI 53706	C. J. Czuprynski	90-37265-5524 9000807	\$120,000	08/01/90 07/31/92	Receptor Binding of Interleukin 1 to Bovine Neutrophils and other Cells

Competitive Research Grants Program
Biotechnology - Animal Growth & Development

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Wisconsin Madison, WI 53706	Gary A. Splitter	90-37265-5703 9000653	\$185,000	09/01/90 08/31/92	Transfected Bovine MHC Class II DR and DQ Genes

TOTAL : \$ 2,475,000

ANIMAL SCIENCE

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The emphasis in this research program is to improve reproductive efficiency in domestic farm animals. Research is supported in all possible problem areas: puberty, ovulation, corpus luteum formation and function, sperm physiology, insemination, fertilization, prenatal death, and poor survival of offspring.

BRUCELLOSIS

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The Brucellosis program supports research at the molecular, cellular, and genetic levels that: define the mechanisms by which Brucella abortus induces disease in cattle and persists as an infectious agent; defines the basis of the bovine immune response with B. abortus that results in protective immunity; through molecular techniques identifies and produces immunogens to stimulate long-lived protective immunity in cattle; identifies and produces antigens to differentiate among non-infected, vaccinated and B. abortus - infected cattle.

ANIMAL REPRODUCTIVE RESEARCH

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This sub-program area supports innovative research in the following categories: (a) mechanisms affecting embryo survival, endocrinological control of embryo development, mechanisms of embryo-maternal interactions, and embryo implantation; (b) factors controlling ovarian function including follicular development, corpus luteum formation and function, and ovulation, (c) gamete physiology, including oogenesis and spermatogenesis gamete maturation, fundamental processes of fertilization, mechanisms regulating gamete survival in vivo and in vitro, and basic questions regarding gamete transport and (d) fundamental questions addressing parturition, postpartum interval to conception and neonatal survival.

Competitive Research Grants Program
Animal Science - Animal Reproductive Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Alabama Birmingham, AL 35294	Jimmy D. Neill	90-37240-5746 9001859	\$155,000	09/01/90 08/31/92	Molecular Studies of the Bovine GnRH Receptor
University of California Davis, CA 95616	Gary P. Moberg	90-37240-5502 9001659	\$161,000	09/01/90 08/31/92	Influence of Stress on Reproduction in Sheep
University of California Davis, CA 95616	Umbert A. Urch	90-37240-5503 9002013	\$286,000	09/01/90 08/31/93	Fertilization in the Pig

Competitive Research Grants Program
Animal Science - Animal Reproductive Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Florida Gainesville, FL 32611	Dan C. Sharp	90-37240-5776 9001872	\$142,000	09/01/90 08/31/92	Vernal Transition as a Model for Folliculogenesis and Ovulation
University of Illinois Urbana, IL 61801	Orrin D. Sherwood	90-37240-5756 9001491	\$150,000	09/01/90 08/31/93	Determination of the Effect of Relaxin on the Cervix in Pregnant Pigs
Purdue Research Fdn. West Lafayette, IN 47907	P. V. Malven	90-37240-5504 9001532	\$154,000	09/01/90 08/31/92	Peptidergic Neurotransmitters Inhibitory to Secretion of Luteinizing Hormone

Competitive Research Grants Program
Animal Science - Animal Reproductive Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Kentucky Research Foundation Lexington, KY 40506-0057	Lee A. Edgerton	90-37240-5505 9001846	\$110,000	09/01/90 08/31/93	Endocrine Regulation of Prostaglandin F2 Secretion in Sows
Tufts University Boston, MA 02111	Katrin Hinrich	90-37240-5757 9001817	\$208,000	09/01/90 08/31/93	Development of Horse and Cow Oocytes Transferred to the Follicle of the Mare
Worcester Foundation for Experimental Biology Schrewsbury, MA 01545	Harvey M. Florman	90-37240-5713 9001661	\$200,000	09/01/90 08/31/92	Modulators of Sperm Signal Transduction during Mammalian Fertilization

Competitive Research Grants Program
Animal Science - Animal Reproductive Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Maryland College Park, MD 20742	Wayne J. Kuenzel	90-37240-5506 9001596	\$165,000	09/01/90 08/31/93	Induction of Early Sexual Maturation in Chicks, Gallus domesticus
University of Michigan Ann Arbor, MI 48109	Fred J. Karsch	90-37240-5507 9001857	\$78,000	09/01/90 08/31/92	Regulation of GnRH Secretion During the Estrous Cycle of the Ewe
University of Michigan Ann Arbor, MI 48109	Douglas L. Foster	90-37240-5616 9001693	\$111,000	09/15/90 09/30/92	Photoperiod Timing of Puberty

Competitive Research Grants Program
Animal Science - Animal Reproductive Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Michigan Ann Arbor, MI 48109	Thomas D. Landefeld	90-37240-5758 9001887	\$150,000	09/01/90 08/31/92	Regulation of Reproductive Hormone mRNAs in Sheep
Michigan State University East Lansing, MI 48824	James J. Ireland	90-37240-5508 9001892	\$260,000	09/01/90 08/31/93	The Role of Inhibins in Ovarian Function
University of Missouri Columbia, MO 65211	Michael F. Smith	90-37240-5777 9001819	\$210,000	09/01/90 08/31/93	Uterine Mechanisms Associated with Subnormal Luteal Function in Cattle

Competitive Research Grants Program
Animal Science - Animal Reproductive Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
North Carolina State University Raleigh, NC 27695-7003	Jeffrey D. Armstrong	90-37240-5511 9001686	\$143,000	09/01/90 08/31/92	Nutritional Factors Controlling Ovarian Function in the Ruminant
University of Nebraska Lincoln, NE 68588-0430	James E. Kinder	90-37240-5714 9001733	\$158,000	09/01/90 08/31/93	Regulation of Ovarian Follicular Development by Circulating Progesterone in the Bovine
Rutgers, The State University Piscataway, NJ 08855-1089	Juan-Pablo Advis	90-37240-5509 9001544	\$195,000	09/01/90 08/31/93	Neuroendocrine Control of Ovulation in the Domestic Hen

Competitive Research Grants Program
Animal Science - Animal Reproductive Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Rutgers, The State University Piscataway, NJ 08855-1089	Alan L. Johnson	90-37240-5510 9001652	\$230,000	09/01/90 08/31/93	Plasminogen Activator and Steroidogenesis During Growth of Hen Ovarian Follicles
Cornell University Ithaca, NY 14853	Joanne E. Fortune	90-37240-5715 9001665	\$250,000	09/01/90 08/31/93	Ovarian Follicular Development and Function in Cattle: Follicular Dominance
Cornell University Ithaca, NY 14853	Patricia A. Johnson	90-37240-5716 9001821	\$114,000	09/15/90 09/30/92	Regulation of Inhibin in the Domestic Hen

Competitive Research Grants Program
Animal Science - Animal Reproductive Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Oregon State University Corvallis, OR 97331	Fredrick Stormshak	90-37240-5778 9001962	\$197,000	09/01/90 08/31/93	Role of Protein Kinase C Isozymes in Oxytocin Secretion by the Bovine Corpus Luteum
Pennsylvania State University University Park, PA 16802	Gary J. Killian	90-37240-5512 9001997	\$142,664	09/01/90 08/31/92	Male Factors Affecting Fertility of Bovine Sperm
South Dakota State University Brookings, SD 57007	Donald P. Evenson	90-37240-5717 9001848	\$85,000	09/01/90 08/31/91	Flow Cytometric Analysis of Mammalian Sperm Fertility Parameters

Competitive Research Grants Program
Animal Science - Animal Reproductive Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE

University of Wisconsin Madison, WI 53706	Neal L. First	88-37240-3740 9001731	\$70,000	09/01/88 08/31/91	Cellular Regulation of Meiotic State in Bovine Oocytes
West Virginia University Morgantown, WV 26506	Robert A. Dailey	90-37240-5513 9001610	\$111,000	09/01/90 08/31/93	Association of Inflammatory-like Reactions in the Ovulatory Process of Gilts

TOTAL : \$ 4,235,664

Competitive Research Grants Program
Animal Science - Brucellosis

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Cornell University Ithaca, NY 14853	Alexander J. Winter	90-37241-5582 9001607	\$249,612	09/01/90 08/31/92	Antigens which Induce Protective Cell-Mediated Immunity Against Brucella abortus
Texas A&M Research Foundation College Station, TX 77843	Joe W. Templeton	90-37241-5583 9001869	\$195,000	09/01/90 08/31/93	Genetics of Natural Resistance to Bovine Brucellosis and Salmonellosis

TOTAL : \$ 444,612

STRATOSPHERIC OZONE DEPLETION

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This program area is part of a Government-wide effort to conduct research on the effects of stratospheric ozone depletion and the ensuing increase in UV-B irradiation. Because the action of UV-B on plants is not an isolated phenomenon but is influenced by other environmental factors, the program area includes, in addition to research on UV-B effects, research on effects of environmental factors on plant processes and the interaction of such factors with UV-B radiation. Further, in the broader context of projected complex global climate change, research essential to understanding normal biological response mechanisms of plants to the environment (atmosphere, temperature, radiation) and the mechanisms brought to bear during environmental stress (increased CO₂, temperature, UV-B Radiation) is supported. The program area includes, but is not limited to: (a) mechanisms of perception of environmental signals, (b) molecular biological and metabolic basis for plant response, and (c) interactions, of environmental factors.

This program area considers all mechanistic and basic studies at the whole plant, cellular, biochemical and molecular levels.

Competitive Research Grants Program
Stratospheric Ozone Depletion

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Arizona Tucson, AZ 85721	Elizabeth Vierling	90-37280-5525 9002385	\$60,000	09/01/90 08/31/91	Expression and Function of Low Molecular Weight Heat Shock Proteins
University of Arizona Tucson, AZ 85721	John C. Cushman	90-37280-5662 9002387	\$100,000	09/01/90 08/31/92	Regulation of CAM Induction by Salt/ Drought Stress
University of California Berkeley, CA 94720	Lewis J. Feldman	90-37280-5526 9001725	\$160,000	09/15/90 09/30/93	Role of a Plant Protein Kinase in Signal Transduction

Competitive Research Grants Program
Stratospheric Ozone Depletion

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California Davis, CA 95616	R. W. Breidenbach	90-37280-5592 9002554	\$75,000	09/01/90 08/31/92	Bioenergetics of Plant Growth Under Normal and Thermally Stressed Conditions
University of California Davis, CA 95616	Jan Dvorak	90-37280-5644 9002549	\$150,000	09/01/90 08/31/93	Gene Regulation by Saline Stress in L. elongatum Wheat and their Amphiploid
An Individual Award Hayward, CA 94545	Rodrigo I. Lois	90-37280-5664 9002368	\$66,000	09/01/90 08/31/92	The Molecular Basis of Plant Defenses against UV Radiation

Competitive Research Grants Program
Stratospheric Ozone Depletion

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California Los Angeles, CA 90024-1406	Eduardo Zeiger	90-37280-5593 9003225	\$50,000	08/01/90 07/31/91	Stomatal Control in Agricultural Crops
University of California Riverside, CA 92521	Elizabeth A. Bray	90-37280-5645 9002404	\$120,000	09/01/90 08/31/92	Regulation of Gene Expression by Absciscic Acid during Drought Stress
University of California Riverside, CA 92521	J. N. Bailey-Serres	90-37280-5663 9002442	\$110,000	09/01/90 08/31/92	Translational Regulation of the Hypoxic Stress Response of Maize Seedling Roots

Competitive Research Grants Program
Stratospheric Ozone Depletion

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Colorado State University Fort Collins, CO 80523	Mark A. Brick	90-37280-5646 9002530	\$31,388	09/01/90 08/31/92	Isotopic Composition, Paraheliotropism, Productivity of Beans under H2O Limit
University of Florida Gainesville, FL 32611	Leo G. Albrigo	90-37280-5457 9003254	\$50,000	08/15/90 08/31/91	Cellular and Whole Plant Complexation and Transport of Zinc and Copper
University of Florida Gainesville, FL 32611	Charles L. Guy	90-37280-5527 9002397	\$200,000	09/01/90 08/31/93	Low Temperature Regulated Genes Associated with Freezing Tolerance in Spinach

Competitive Research Grants Program
Stratospheric Ozone Depletion

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
USDA/ARS South Atlantic Area Athens, GA 30613	M. G. Redinbaugh	90-37280-5474 9002408	\$107,000	09/01/90 08/31/92	Induction by Environmental Nitrate of a Unique Metabolic State in Plant Roots
University of Hawaii Honolulu, HI 96822	Harry Y. Yamamoto	90-37280-5594 9002448	\$100,000	09/01/90 08/31/92	Mechanisms of Xanthophyll Responses that Protect Plants Against Excess Light
Iowa State University of Science and Technology Ames, IA 50011	Cecil R. Stewart	90-37280-5665 9002444	\$70,000	09/01/90 08/31/92	Effect of Environmental Stresses on Mitochondrial Proline Oxidation

Competitive Research Grants Program
Stratospheric Ozone Depletion

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Purdue Research Fdn. West Lafayette, IN 47907	Nicholas C. Carpita	90-37280-5647 9002498	\$80,000	08/01/90 07/31/92	Alteration of Cell Wall Structure and Metabolism upon Adaptation to Saline
Purdue Research Fdn. West Lafayette, IN 47907	David Rhodes	90-37280-5721 9002484	\$60,044	09/01/90 08/31/91	Genetics of Betaine Accumulation in Maize and Sorghum
Massachusetts General Hospital Boston, MA 02114	Frederick M. Ausubel	90-37280-5705 9002499	\$100,000	09/01/90 08/31/92	Regulation of the Arabidopsis thaliana Chalcone Synthase Gene

Competitive Research Grants Program
Stratospheric Ozone Depletion

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Michigan State University East Lansing, MI 48824	Andrew D. Hanson	90-37280-5595 9001636	\$180,000	09/01/90 08/31/93	Molecular Basis and Manipulation of Stress-induced Betaine Synthesis in Plants
University of Minnesota St. Paul, MN 55108	N. S. Plesofsky-Vig	90-37280-5458 9002545	\$107,000	09/01/90 08/31/92	Function and Localization of a Crystallin-Related Heat Shock Protein
University of Missouri Columbia, MO 65211	C. Donald Miles	90-37280-5459 9002524	\$110,000	09/01/90 08/31/92	The Role of UV-B in Alterations of Light Reaction in Higher Plant Photosynthesis

Competitive Research Grants Program
Stratospheric Ozone Depletion

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Duke University Durham, NC 27706	C. Barry Osmond	90-37280-5612 9002458	\$60,000	08/01/90 07/31/91	Interacting Abiotic (Light, N) and Biotic (Virus) Stress in Tobacco Leaves
University of Nebraska Lincoln, NE 68588-0430	Philip M. Kelley	90-37280-5787 9002418	\$50,000	09/15/90 09/30/91	Proteolytic Activation of Ethanollic Fermentation in Anaerobic Maize Roots
Rutgers, The State University New Brunswick, NJ 08903	Eric Lam	90-37280-5648 9002426	\$110,000	09/01/90 08/31/92	Molecular Analysis of a Light Responsive Element

Competitive Research Grants Program
Stratospheric Ozone Depletion

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Boyce Thompson Institute for Plant Research, Inc. Ithaca, NY 14853	Stephen H. Howell	90-37280-5009 9000624	\$1,000	03/01/90 05/31/90	Plant Signal Transduction: Linking Environmental Signals to Gene Expression
Cornell University Ithaca, NY 14853	Monica A. Geber	90-37280-5460 9002454	\$125,000	09/01/90 08/31/92	Developmental and Physiological Effects on Yield under Drought
Boyce Thompson Institute for Plant Research, Inc. Ithaca, NY 14853	Robert L. Last	90-37280-5677 9002427	\$140,000	09/01/90 08/31/92	Arabidopsis: A Model System for the Study of UV-B Response in Higher Plants

Competitive Research Grants Program
Stratospheric Ozone Depletion

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Ohio State University Research Foundation Columbus, OH 43212	Brian A. McBlain	90-37280-5461 9003227	\$52,000	09/01/90 08/31/91	Role of C and N Partitioning in Tolerance to Moisture Stress in Soybean
Ohio State University Research Foundation Columbus, OH 43212	Desh Pal S. Verma	90-37280-5596 9002369	\$110,000	09/15/90 09/30/92	Proline Biosynthetic Genes and Control of Osmotic Stress in Plants
Oklahoma State University Stillwater, OK 74078-0500	Bjorn C. Martin	90-37280-5666 9002401	\$110,000	09/01/90 08/31/92	Variation in Water- Use Efficiency of Wheat and Mechanisms of Its Control

Competitive Research Grants Program
Stratospheric Ozone Depletion

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Oregon State University Corvallis, OR 97331	Tony H. Chen	90-37280-5528 9002560	\$110,000	09/01/90 08/31/92	Efficient Expression of Warm-Temperature Ice Nuclei in Transgenic Plants
Oregon State University Corvallis, OR 97331	John B. Hays	90-37280-5597 9002559	\$140,000	09/01/90 08/31/92	Repair of UV-DNA in Arabidopsis thaliana
USDA/ARS Southern Plains Area College Station, TX 77840	David L. Ferguson	90-37280-5462 9002374	\$50,000	09/01/90 08/31/91	Oxidation of Methionyl Residues in Crops Exposed to Environmental Stresses

Competitive Research Grants Program
Stratospheric Ozone Depletion

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Texas A&M Research Foundation College Station, TX 77843	John E. Mullet	90-37280-5475 9002558	\$60,000	08/15/90 08/31/91	Genes Induced by Plant Water Deficit
Texas Tech University Lubbock, TX 79409	Randy D. Allen	90-37280-5722 9002552	\$50,000	09/01/90 08/31/91	Strategies for the Development of Air Pollution Tolerance Using Transgenic Plants
University of Utah Salt Lake City, UT 84112	James R. Ehleringer	90-37280-5649 9002405	\$108,612	09/01/90 08/31/92	Isotopic Composition, Paraheliotropism, Productivity of Beans under H2O Limit

Competitive Research Grants Program
Stratospheric Ozone Depletion

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Washington State University Pullman, WA 99164-1030	Gerald Edwards	90-37280-5706 9000829	\$100,000	09/15/90 09/30/92	Temperature Dependence of Photosynthesis

TOTAL : \$ 3,463,044

PEST SCIENCE

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Before successful strategies for managing insect pests can be developed, a strong basic insect biology research effort is needed. This program provides support for highly deleterious insect pests. Emphasis is on the following research areas: insect-host interactions, population dynamics, behavioral ecology and physiology, genetics (population and molecular), chemical ecology, endocrinology, biochemistry, and interactions of insect pathogens, parasites, and predators with their pest hosts. The proposals under this area were reviewed by the Plant Pest Science panel.

Competitive Research Grants Program
Pest Science

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California Berkeley, CA 94720	Donald L. Dahlsten	90-37250-5406 9001279	\$40,000	09/01/90 08/31/92	Attraction of Hymenopterous Parasitoids to Pine Bark Beetles
University of California Davis, CA 95616	Bruce D. Hammock	90-37250-5239 9003249	\$50,000	09/01/90 08/31/91	Affinity Purified JH Esterase and Its Gene for Bollworm Control
Colorado State University Fort Collins, CO 80523	Louis B. Bjostad	90-37250-5371 9001320	\$120,000	07/01/90 06/30/92	Chemical Ecology of Host Location by Western Corn Rootworm Larvae

Competitive Research Grants Program
Pest Science

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Georgia Research Foundation, Inc. Athens, GA 30602	Charles W. Berisford	90-37250-5267 9001329	\$63,000	07/01/90 06/30/92	Attraction of Hymenopterous Parasitoids to Pine Bark Beetles
USDA/ARS South Atlantic Area Athens, GA 30613	Peter J. Landolt	90-37250-5356 9001302	\$100,000	07/15/90 07/31/92	Mate-Finding Strategies of the Cabbage Looper
Iowa State University of Science and Technology Ames, IA 50011	John J. Obrycki	90-37250-5357 9001372	\$76,000	07/15/90 07/31/92	Interactions of Exotic and Native Coccinellid Species

Competitive Research Grants Program
Pest Science

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Kansas State University Manhattan, KS 66506	Marion O. Harris	90-37250-5470 9001327	\$100,000	09/01/90 08/31/92	Endogenous Factors and Chemical Cues Influencing Behavior of the Hessian Fly
Kansas State University Manhattan, KS 66506	Barry A. Dover	90-37250-5481 9001319	\$180,000	09/01/90 08/31/93	The Role of Parasitoid Factors in Developmental Disruption of Multiple Hosts
Louisiana State University and A&M College Baton Rouge, LA 70893-0905	Dorothy P. Pashley	90-37250-5268 9001251	\$172,000	07/01/90 06/30/93	Geographic Variation in Two Fall Armyworm Host Strains

Competitive Research Grants Program
Pest Science

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Massachusetts Amherst, MA 01003	Joseph G. Kunkel	90-37250-5336 9001245	\$120,000	08/01/90 07/31/92	Gypsy Moth Population Biology: The Function and Roles of Storage Proteins
USDA/ARS Beltsville Area* Beltsville, MD 20705	Minh-Tam B. Davis	S90-37153-5557* 9001304	\$60,000*	09/15/90 09/30/93	Characterization and Localization of PBAN Receptors in Heloithis zea
University of Maryland College Park, MD 20742	Charles Mitter	90-37250-5482 9001274	\$70,000	09/01/90 08/31/92	Heliothine Biosystematics: Phylogenetic Origins of the Major Pest Complexes

*Grant split-funded with Entomology/Nematology area where the actual count is included.
Total amount awarded \$180,000.

Competitive Research Grants Program
Pest Science

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Minnesota St. Paul, MN 55108	Timothy J. Kurtti	90-37250-5269 9001241	\$150,000	09/01/90 08/31/93	Strain Improvement of Microsporidia for Use in Corn Pest Management Systems
Mississippi State University Mississippi State, MS 39762	James L B. Mallet	90-37250-5358 9001467	\$120,000	08/15/90 08/31/92	Genetic Methods for Estimating Gene Flow in Tobacco Budworm and Cotton Bollworm
Boyce Thompson Institute for Plant Research Ithaca, NY 14853	Ann E. Hajek	90-37250-5483 9001317	\$120,000	09/01/90 08/31/92	Host Plant Gypsy Moth Interactions Affecting an Entomopathogenic Fungus

Competitive Research Grants Program
Pest Science

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Oklahoma State University Stillwater, OK 74078-0500	A. C. Guenzi	90-37250-5276 9001393	\$10,000	07/01/90 06/30/91	Aphid-Plant Interactions: Populations to Molecules
Temple University Philadelphia, PA 19122	M. G. Wolfersberger	90-37250-5442 9001270	\$100,000	07/01/90 06/30/92	Rational Design of Gypsy Moth Control Proteins
Clemson University Clemson, SC 29634	David G. Heckel	89-37250-4564 9003250	\$50,000	08/01/89 12/31/91	Basic and Applied Genetic Linkage Mapping in <i>Heliothis virescens</i>

Competitive Research Grants Program
Pest Science

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Wisconsin Madison, WI 53706	Kenneth F. Raffa	90-37250-5581 9001318	\$71,300	09/15/90 09/30/92	Role of Root Invading Insects and Fungi in Patterns of Host use by Bark Beetles
Marquette University Milwaukee, WI 53233	A. Krishna Kumaran	90-37250-5559 9001328	\$100,000	09/15/90 09/30/92	Molecular Analysis of Reproduction in the Boll Weevil Male

TOTAL : \$ 1,872,300

HUMAN REQUIREMENTS FOR NUTRIENTS (HUMAN NUTRITION)

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The emphasis in this program area is on determining human requirements for nutrients. Support is not provided for clinical research, demonstration or action projects, nor for surveys of the nutritional status of population groups.

Research in human nutrition contributes to improving human nutritional status by increasing our understanding of requirements for nutrients. Findings help fill the gaps of our knowledge related to nutrient requirements, bioavailability, the interrelationships of nutrients, and the nutritional value of food consumed in the United States, and of the nutrient condition of healthy individuals as all of these relate to human nutrient requirements. Studies of the biochemical and molecular basis for nutrient requirements will help determine why a nutrient is required and what its function is in the cell. Molecular biology of factors interacting with nutrients, such as receptors, carrier proteins and binding proteins, is also studied. Innovative approaches to these fundamental research problems are encouraged.

Competitive Research Grants Program
Human Nutrition

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California Davis, CA 95616	Barbara O. Schneeman	90-37200-5348 9000697	\$86,707	07/01/90 06/30/92	Postprandial Lipemia: Response to Dietary Fiber
University of California Davis, CA 95616	Quinton R. Rogers	90-37200-5440 9000933	\$186,960	08/01/90 07/31/93	Neural Responses to Disproportionate Amino Acid Diets: Role of Monoamines
University of Connecticut Storrs, CT 06269-2086	Lindsay H. Allen	90-37200-5478 9000789	\$143,750	09/01/90 08/31/93	Response of Mexican Children to Zinc and Iron Supplements

Competitive Research Grants Program
Human Nutrition

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Georgetown University Washington, DC 20057	Mark R. Chance	90-37200-5359 9000672	\$48,684	07/01/90 06/30/91	Binding of Cobalamins to Transcobalamin-II: A Biophysics Study
University of Florida Gainesville, FL 32611	Lynn B. Bailey	90-37200-5636 9000902	\$50,493	09/01/90 08/31/92	Zinc Requirements as Estimated by Erythrocyte Metallothionein
Iowa State University of Science and Technology Ames, IA 50011	Robert E. Serfass	90-37200-5383 9001093	\$98,598	09/01/90 08/31/92	Kinetic Analysis of Zinc Metabolism, Status, and Requirements

Competitive Research Grants Program
Human Nutrition

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Purdue Research Fdn. West Lafayette, IN 47907	Paula R. Trumbo	90-37200-5637 9000877	\$43,611	09/01/90 08/31/91	Aging and Vitamin B6 Bioavailability
Kansas State University Manhattan, KS 66506	Sung I. Koo	90-37200-5479 9000859	\$78,185	09/01/90 08/31/92	Zinc Deficiency: Its Effect on Vitamin A Transport
University of Massachusetts Worcester, MA 01605	Susan S. Baker	90-37200-5238 9000763	\$75,000	09/01/90 08/31/91	Selenium: Single Nutrient Regulation of Glutathione Peroxidase

Competitive Research Grants Program
Human Nutrition

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Federation of American Societies for Experimental Biology Rockville, MD 20814	Peter J. A. Davies	90-37200-5193 9000642	\$6,000	06/01/90 05/31/91	FASEB Summer Research Conference on Retinoids
Michigan State University East Lansing, MI 48824	Loran L. Bieber	90-37200-5349 9000676	\$87,250	07/01/90 06/30/92	Role of Carnitine and Acetylcarnitine in Host Defense Processes of Human MNP
University of Minnesota St. Paul, MN 55108	Linda J. Brady	90-37200-5266 9000689	\$36,000	07/01/90 06/30/92	Induction of Carnitine Acyltransferases by Fatty Acids and Metabolites

Competitive Research Grants Program
Human Nutrition

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
North Carolina State University Raleigh, NC 27695-7003	Steven J. Schwartz	90-37200-5480 9000917	\$47,500	09/01/90 08/31/92	Assay of Cis- Carotene Isomers in Human Plasma
Univ. of Med. & Dentistry of NJ, Sch. of Osteopathic Med. Camden, NJ 08103	Deborah L. Baly	90-37200-5382 9000711	\$94,188	09/01/90 08/31/92	Effect of Zinc Deficiency on Pancreatic Insulin Metabolism
Cornell University Ithaca, NY 14853	Martha H. Stipanuk	90-37200-5469 9000895	\$109,524	09/01/90 08/31/92	Use of Cysteine Pro- drugs Versus Sulfur Amino Acids as a Source of Cysteine

Competitive Research Grants Program
Human Nutrition

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Oregon State University Corvallis, OR 97331	Philip D. Whanger	90-37200-5657 9000912	\$167,656	09/01/90 08/31/93	Influence of Pregnancy on Selenium Metabolism in Women of Low Selenium Status
Thomas Jefferson University Philadelphia, PA 19107	Rocky S. Tuan	90-37200-5265 9000795	\$43,882	07/01/90 06/30/91	Cellular and Molecular Analysis of Placental Calcium Transport

TOTAL : \$ 1,403,988

FORESTRY RESEARCH

WOOD UTILIZATION

--

Improved wood utilization practices depend upon a continually advancing scientific foundation of basic research in wood properties and fundamental components of wood science. This program area supports research that addresses critical barriers to improved wood utilization and that will provide the scientific base from which new research and development can proceed. The major areas of focus include: (1) wood chemistry and biochemistry, (2) physical and mechanical properties of wood and basic processing technology, (3) structural wood engineering, and (4) harvesting and forest engineering with emphasis on the impact of harvesting upon forest productivity, quality and quantity of harvest, or other aspects of wood utilization. Innovative approaches to solving fundamental problems in the field of wood science and technology are encouraged.

FOREST BIOLOGY

--

Forest biology emphasizes two areas: (1) Genetic structure and function, which is aimed at utilizing variations and adaptations that exist in gene pools of existing populations. Research focus is on development of knowledge of woody plant genomes, identification of valuable genes, elucidation of controls of genetic expression, as well as basic research necessary for development of genetic engineering techniques, including regeneration of whole plants from cell and tissue culture. (2) Mechanisms of interactions in forest systems, the objectives of which are to gain a basic understanding of the forces that influence forest ecosystems, especially their development and productivity. Research is needed in this area to increase knowledge of the mechanisms driving synergistic processes and those involved in antagonistic relationships of forest organisms.

Competitive Research Grants Program
Forest Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Auburn University Auburn University, AL	Paul A. Lemke 36849	90-37290-5667 9002668	\$106,000	09/15/90 09/30/92	Transgenic Manipulation of Ectomycorrhizal Symbiosis
Auburn University Auburn University, AL	Dean H. Gjerstad 36849	90-37290-5678 9000961	\$88,000	09/15/90 09/30/92	Intra- and Interspecific Interference Among Three Perennial Species - A Mechanistic Approach
University of Idaho Moscow, ID	John D. Marshall 83843	90-37290-5679 9002788	\$117,000	09/15/90 09/30/93	Differences in Water Sources Among Conifer Species Along an Elevation Gradient

Competitive Research Grants Program
Forest Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Kentucky Research Foundation Lexington, KY 40506-0057	Thomas W. Kimmerer	90-37290-5680 9002819	\$171,000	09/01/90 08/31/92	Physiology and Genetics of Alcohol Dehydrogenase in Populus
University of Kentucky Research Foundation Lexington, KY 40506-0057	David B. Wagner	90-37290-5681 9002682	\$158,000	09/15/90 09/30/93	Nuclear Dicytoplasmic Disequilibria in Pinus Banksiana and P. Contorta
Michigan State University East Lansing, MI 48824	Kurt S. Pregitzer	90-37290-5668 9002692	\$188,000	09/15/90 09/30/92	Atmospheric CO2 and Feedback in the Plant-Soil System

Competitive Research Grants Program
Forest Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
North Carolina State University Raleigh, NC 27695-7003	Ronald R. Sederoff	90-37290-5682 9002683	\$130,000	09/01/90 08/31/92	Regulation of Xylem- Specific Gene Expression in Loblolly Pine
University of Nebraska Lincoln, NE 68583-0704	Stephen G. Ernst	90-37290-5669 9002625	\$125,000	09/15/90 09/30/92	Molecular Characterization of Shoot Induction Competence Events in Populus Deltoides
University of New Hampshire Durham, NH 03824-3586	Thomas D. Lee	90-37290-5670 9002722	\$105,000	09/15/90 09/30/92	Etiology and Dynamics of Canopy Gaps in Spruce-Fir Forests

Competitive Research Grants Program
Forest Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Oregon State University Corvallis, OR 97331	Steven H. Strauss	90-37290-5683 9002806	\$146,000	09/15/90 09/30/92	Genetic Engineering of Sterility in Poplar
Texas A&M Research Foundation College Station, TX 77843	Neal K. Van Alfen	90-37290-5671 9002732	\$120,000	09/15/90 03/31/93	Transmissible Hypovirulence: Model for Forest Disease Control
Univ. of Vermont and State Agricultural College Burlington, VT 05405-0106	T. D. Scherbatskoy	90-37290-5684 9002821	\$128,000	09/01/90 08/31/92	Mechanisms of Forest Canopy Exchange of Ions

Competitive Research Grants Program
Forest Biology

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Washington Seattle, WA 98195	Douglas G. Sprugel	90-37290-5685 9002688	\$160,000	09/01/90 02/28/93	Acclimation to Changing Light Environments in an Abies Amabilis Canopy
University of Wisconsin Madison, WI 53706	Peter B. Reich	90-37290-5686 9002843	\$129,826	09/15/90 09/30/93	Post-Fire Ecology of Red Oak and Competing Hardwood Regeneration in Wisconsin

TOTAL : \$ 1,871,826

Competitive Research Grants Program
Wood Utilization

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California Berkeley, CA 94720	Arno P. Schniewind	90-37291-5762 9002462	\$74,500	09/01/90 08/31/93	Fracture Mechanics Approach to Linking Acoustic Emission and the Drying Process
University of California Berkeley, CA 94720	Stephen L. Quarles	90-37291-5763 9002429	\$115,100	09/01/90 08/31/93	Acoustic Wave Propagation in Wood
University of California Berkeley, CA 94720	David A. Dornfeld	90-37291-5764 9002466	\$67,100	09/01/90 08/31/93	Monitoring Abrasive Machining Processes in Wood with Acoustic Emission

Competitive Research Grants Program
Wood Utilization

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California Davis, CA 95616	John A. Miles	90-37291-5747 9002720	\$77,900	09/01/90 08/31/92	Automated Yarder Controls for Improved Safety and Productivity
Colorado State University Fort Collins, CO 80523	Patrick J. Pellicane	90-37291-5748 9002643	\$38,800	09/15/90 09/30/91	Modelling the Mechanical Behavior of Nail/Glue Connections
Purdue Research Fdn. West Lafayette, IN 47907	Nancy W. Y. Ho	90-37291-5707 9002739	\$60,100	09/01/90 08/31/91	Site-Specific Mutagenesis for the Modification of the Enzyme for Yeast Xylose Fermentation

Competitive Research Grants Program
Wood Utilization

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
USDA Forest Service New Orleans, LA 70113	Richard W. Hemingway	90-37291-5765 9002613	\$82,300	09/15/90 09/30/92	Curing Characteristics of Tannin-Based Adhesives for Laminated Lumber
University of Maine Orono, ME 04469	Barbara J. W. Cole	90-37291-5766 9002661	\$61,000	09/01/90 08/31/92	Chemical Modification of High Yield Pulps
University of Maine Orono, ME 04469	Barry S. Goodell	90-37291-5767 9002676	\$52,100	09/01/90 08/31/91	Fungal Siderophores and their Role in Wood Biodegradation

Competitive Research Grants Program
Wood Utilization

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Michigan State University East Lansing, MI 48824	Indrek S. Wichman	90-37291-5768 9002677	\$81,100	09/01/90 08/31/92	Wind-Aided Flame Spread Over Wood
Michigan Technological University Houghton, MI 49931	Wilbur H. Campbell	90-37291-5708 9002399	\$82,400	09/01/90 08/31/92	Biochemistry and Molecular Biology of Monolignol Biosynthetic Enzymes in Woody Species
North Carolina State University Raleigh, NC 27695-7003	Chen-Loung Chen	90-37291-5723 9002726	\$65,200	09/15/90 09/30/92	Structure and Response of Polychlorinated Oxylignins from Bleach Plant Effluents Towards Biodegradation and UV-Excimer Laser etc

Competitive Research Grants Program
Wood Utilization

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Research Foundation of State University of New York Albany, NY 12201	James J. Worrall	90-37291-5769 9002520	\$97,600	09/15/90 09/30/92	Non-Traditional Decays of Wood
Research Foundation of State University of New York Albany, NY 12201	Kenneth E. Hammel	90-37291-5770 9002654	\$137,800	09/01/90 08/31/92	Enzymatic Depolymerization of Lignin in Vitro
Virginia Polytechnic Institute and State University Blacksburg, VA 24061	James D. Dolan	90-37291-5709 9002506	\$39,800	09/15/90 09/30/92	Investigation of the Dynamic Response of Timber Building Structural Components

Competitive Research Grants Program
Wood Utilization

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Virginia Polytechnic Institute and State University Blacksburg, VA 24061	Frederick A. Kamke	90-37291-5749 9002882	\$47,500	09/15/90 09/30/92	Sorption Behavior of Wood at Elevated Temperature and Pressure
Virginia Polytechnic Institute and State University Blacksburg, VA 24061	Siegfried M. Holzer	90-37291-5771 9002612	\$41,500	09/01/90 08/31/92	Effects of Long-Term Creep on Integrity of Modern Wood Structures
University of Washington Seattle, WA 98195	Kyosti V. Sarkanen	90-37291-5750 9002764	\$89,600	09/01/90 08/31/92	Characterization of Lignins by Ozonation

Competitive Research Grants Program
Wood Utilization

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Wisconsin Madison, WI 53706	Shun N. Cheng	90-37291-5710 9002514	\$89,800	09/01/90 08/31/92	A General Strength Theory for Anisotropic Materials
USDA Forest Service Madison, WI 53705	Daniel Cullen	90-37291-5724 9002719	\$101,300	09/01/90 08/31/92	Expression of Phanerochaete Chrysosporium Cellobiohydrolases in Aspergillus
USDA Forest Service Madison, WI 53705	T. Kent Kirk	90-37291-5725 9002633	\$60,800	09/01/90 08/31/91	Biochemistry of Lignin Degradation by Phanerochaete Chrysosporium

Competitive Research Grants Program
Wood Utilization

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
USDA Forest Service Madison, WI 53705	Robert H. White	90-37291-5751 9002655	\$57,400	09/01/90 02/28/93	Development of Improved Fire Resistant Truss Assemblies
USDA Forest Service Madison, WI 53705	Hao C. Tran	90-37291-5752 9002636	\$19,400	09/15/90 09/30/91	Development of Compartment Wall Fire Model for Wood Products
USDA Forest Service Madison, WI 53705	Terry L. Highley	90-37291-5753 9002777	\$63,600	09/01/90 08/31/91	The Cellulose Depolymerizing Agent of Brown-Rot Fungi

Competitive Research Grants Program
Wood Utilization

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
USDA Forest Service Madison, WI 53705	George E. Myers	90-37291-5772 9002733	\$77,100	09/01/90 08/31/91	Improving the Moisture Resistance of Urea-Formaldehyde Bonded Wood Products
USDA Forest Service Madison, WI 53705	John A. Youngquist	90-37291-5773 9002725	\$91,026	09/01/90 08/31/92	Use of Bonding Agents to Improve Properties of Wood Fiber - Polyolefin Composition

TOTAL : \$ 1,871,826

SPECIAL RESEARCH GRANTS PROGRAM

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The objective of this grant program is to carry out research to facilitate or expand promising breakthroughs in areas of food and agricultural sciences of importance to the Nation. Two major areas of research were funded under this program during fiscal year 1990:

Animal Health Research	\$5,340,084
Aquaculture Research	<u>533,724</u>
TOTAL	\$5,873,808

This program is administered under the authority of Section 2(c) (1) of P.L. 89-106, as amended. Eligible institutions include land-grant colleges and universities, State agricultural experiment stations, and all colleges and universities having a demonstrable capacity in food and agricultural research.

A brief description of each of the two areas of research in the Special Research Grants Program follows with a listing of research grants awarded in each for FY 1990.

ANIMAL HEALTH

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Overall, this research is to develop and/or refine biological and chemical methods to suppress animal losses from infectious and noninfectious diseases and internal and external parasites. The research is directed toward clarifying infectious and noninfectious diseases and parasites and their interactive effects on animal health; and to develop practical and implementable management systems for the producer to prevent or alleviate these causes of animal losses.

Research includes clarification of complex or unknown etiologies, development or improvement of diagnostic methodologies, clarification of disease pathogenesis and methods of transmission, studies of resistance mechanisms and resistance-enhancing factors and development of disease prevention, control or eradication technologies.

Research is centered on highest priority animal health problems of beef and dairy cattle, swine, poultry, sheep and goats, horses and aquaculture species as identified by the Animal Health Science Research Advisory Board.

The Advisory Board recommended that funding be made available for Animal Welfare Studies and Salmonellosis, especially the Salmonella enteritidis problem. This includes studies on major causes of disease losses in beef and dairy cattle production such as the respiratory disease complex, reproductive diseases including brucellosis and anestrus, enteric and digestive diseases, mastitis, bluetongue, parasites and metabolic diseases.

Research on swine centers on health hazards such as enteric , reproductive and respiratory diseases, and other major problems such as pseudorabies and trichinosis. Poultry disease studies include respiratory diseases, skeletal problems, enteric, neoplastic and immunologic disorders. Sheep research includes diseases such as food rot, respiratory diseases, parasites and bluetongue. Equine health research centers on respiratory, enteric and reproductive diseases and musculo-skeletal disorders. Research on diseases in aquaculture species also is included.

Special Research Grants Program
Animal Health Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Arizona Tucson, AZ 85721	Joseph G. Songer	90-34116-5330 9002339	\$91,154	09/01/90 08/31/92	In Vitro Methods for Diagnosis of Clostridium perfringens Enterotoxemias
University of California Davis, CA 95616	Rance B. LeFebvre	90-34116-5393 9002050	\$146,570	09/01/90 08/31/93	Genetic Probes for the Diagnosis of Leptospire Infection of North American Cattle and Swine
University of California Davis, CA 95616	Bennie I. Osburn	90-34116-5401 9002315	\$100,000	09/01/90 08/31/92	Salmonella enteritidis Infection of Poultry: Detection Via Polymerase Chain Reaction

Special Research Grants Program
Animal Health Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Colorado State University Fort Collins, CO 80523	Ramesh K. Akkina	90-34116-5385 9002329	\$91,155	08/01/90 07/31/93	Molecular Analysis of Pestivirus Border Disease Virus
University of Delaware Newark, DE 19711	John K. Rosenberger	90-34116-5328 9002296	\$100,720	08/01/90 07/31/92	Effects of Chicken Anemia Agent and Infectious Bursal Disease Virus on Lymphoid Cells and Immune Responsiveness
University of Florida Gainesville, FL 32611	David R. Allred	90-34116-5404 9002185	\$138,150	09/01/90 08/31/93	Identification, Cloning and Immunogenicity of Anaplasma marginale Invasins

Special Research Grants Program
Animal Health Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Georgia Research Foundation, Inc. Athens, GA 30602	Debra D. Morris	90-34116-5376 9002352	\$60,202	08/01/90 07/31/92	Hemostatic Abnormalities in Equine Neonatal Septicemia Endotoxemia
University of Georgia Research Foundation, Inc. Athens, GA 30602	William L. Ragland	90-34116-5402 9002303	\$78,084	08/01/90 07/31/93	Avian Thymic Hormone Interaction with Chicken Receptor Cells
Iowa State University of Science and Technology Ames, IA 50011	Theodore T. Kramer	90-34116-5365 9002248	\$138,535	08/01/90 07/31/93	The Perfused Swine Liver Models for Salmonella Invasion and Immunity

Special Research Grants Program
Animal Health Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Iowa State University of Science and Technology Ames, IA 50011	Gary D. Osweiler	90-34116-5378 9002264	\$92,174	08/01/90 07/31/93	Chemical and Toxicological Characterization of Fumonisin Mycotoxins in Swine
Iowa State University of Science and Technology Ames, IA 50011	Merlin L. Kaeberle	90-34116-5405 9002330	\$84,695	09/01/90 08/31/93	Mycoplasma ovipneumoniae and Respiratory Disease in Lambs
University of Illinois Urbana, IL 61801	Howard B. Gelberg	90-34116-5327 9002256	\$149,878	09/01/90 08/31/93	Isolation and Characterization of the Enterocyte Receptor for Porcine Rotavirus

Special Research Grants Program
Animal Health Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Illinois Urbana, IL 61801	Walter L. Hurley	90-34116-5362 9002127	\$148,748	08/01/90 07/31/93	Autocrine Paracrine Control of Mammary Lactoferrin During Mastitis
University of Illinois Urbana, IL 61801	William C. Wagner	90-34116-5394 9002085	\$149,922	08/01/90 07/31/92	Bovine Neutrophil Function and Periparturient Disorders
Purdue Research Fdn. West Lafayette, IN 47907	L. Kirk Clark	90-34116-5387 9002267	\$118,793	09/01/90 08/31/92	Host-Agent Interactions of Mycoplasmal Pneumonia of Swine

Special Research Grants Program
Animal Health Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Kansas State University Manhattan, KS 66506	Bradley W. Fenwick	90-34116-5369 9002265	\$118,393	08/01/90 07/31/92	Identification of Infection Dependent Antigens of Actinobacillus pleuropneumoniae
University of Maryland College Park, MD 20742	Vikram N. Vakharia	90-34116-5399 9002287	\$146,175	09/01/90 08/31/93	Synthesis and Immunogenicity of Infectious Bursal Disease Virus Stuctural Proteins
Michigan State University East Lansing, MI 48824	Roger K. Maes	89-34116-4884 9002258	\$149,720	09/01/89 08/31/92	PCR Based Detection and Quantitation of Pseudorabies Virus Latency

Special Research Grants Program
Animal Health Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Michigan State University East Lansing, MI 48824	Paul M. Coussens	90-34116-5329 9002308	\$149,811	08/01/90 07/31/92	Development of Recombinant Marek's Disease Vaccine Virus
Michigan State University East Lansing, MI 48824	Norman E. Robinson	90-34116-5331 9002351	\$100,000	08/01/90 07/31/92	Mechanisms of Furosemide's Action on Horse Airways
University of Minnesota St. Paul, MN 55104	Russell F. Bey	90-34116-5379 9002259	\$113,754	08/01/90 07/31/93	Epizootology and Potential Economic Impact of Influenza A Infections in Swine

Special Research Grants Program
Animal Health Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Mississippi Medical Center* Jackson, MS 39216	Jan E. Bly	S90-34123-5135* 9002221	\$31,080*	09/15/90 09/30/92	Winter Kill in Channel Catfish: Temperature, Lipids and Immunity
Montana State University Bozeman, MT 59717	Clarence A. Speer	90-34116-5325 9002172	\$149,369	09/01/90 08/31/93	Functional Recombinant Antigens against Bovine Coccidiosis
North Dakota State University of Agriculture & Applied Sci. Fargo, ND 58105	Eugene S. Berry	90-34116-5395 9002045	\$49,106	08/01/90 07/31/92	Heterologous BVDV Detection and Comparison Using Oligonucleotides and PCR

*Grant split-funded with Aquaculture Research area where the actual count is included.
Total amount awarded \$70,521.

Special Research Grants Program
Animal Health Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE

University of Nebraska Lincoln, NE 68583-0704	S. Srikumaran	90-34116-5354 9002103	\$149,940	08/01/90 07/31/93	Molecular Characterization of Bovine Herpesvirus 1 Host Cell Receptor Interactions
University of Nebraska Lincoln, NE 68583-0704	Fernando A. Osorio	90-34116-5366 9002142	\$138,205	08/01/90 07/31/92	Interaction of Persistent Viruses with the Bovine Immune System: The Cellular Basis of BVDV Lymphtropism
University of Nebraska Lincoln, NE 68583-0704	Ruben O. Donis	90-34116-5367 9002107	\$133,340	08/01/90 07/31/92	Molecular Bases of BVD Virus Cytopathology and Disease

Special Research Grants Program
Animal Health Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Cornell University Ithaca, NY 14853	Patrick L. McDonough	90-34116-5400 9002318	\$100,000	08/01/90 07/31/92	Detection of Avian Antibody Response to Salmonella enteritidis by K ELISA
Ohio State University Research Foundation Columbus, OH 43212	Kenny V. Brock	90-34116-5286 9002070	\$149,947	09/01/90 08/31/93	Transmission of Bovine Viral Diarrhea Virus from Persistently-Infected Embryo Transfer Donors
Ohio State University Research Foundation Columbus, OH 43212	Linda J. Saif	90-34116-5364 9002145	\$149,997	09/01/90 08/31/93	Winter Dysentery in Cows: Etiology and Analysis of Coronaviruses from Outbreaks

Special Research Grants Program
Animal Health Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Ohio State University Research Foundation Columbus, OH 43212	Daral J. Jackwood	90-34116-5403 9002249	\$122,382	09/01/90 08/31/93	Nucleic Acid Probes for the Diagnosis of Transmissible Gastroenteritis Virus
Oklahoma State University Stillwater, OK 74078	Cyril R. Clarke	90-34116-5326 9002099	\$124,284	09/01/90 08/31/93	The Role of Eicosanoids in Pathogenesis of Pasteurella haemolytica Infection
Oklahoma State University Stillwater, OK 74078	K. D. Clinkenbeard	90-34116-5353 9002106	\$150,000	08/01/90 07/31/93	Identification and Isolation of the Pasturella haemolytica Leukotoxin Receptor

Special Research Grants Program
Animal Health Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Oklahoma State University Stillwater, OK 74078	Katherine M. Kocan	90-34116-5397 9002179	\$56,468	08/01/90 07/31/91	Cultivation of Anaplasma Marginale from Tick Salivary Glands into Cell Culture
Oregon State University Corvallis, OR 97331	Stephen L. Kaattari	90-34116-5134 9002204	\$75,722	09/15/90 09/30/92	Development of Enteric-Protected Vaccines for Aquaculture
Univ. of Pennsylvania Philadelphia, PA 19104	Linda H. Keller	90-34116-5396 9002311	\$142,072	08/01/90 07/31/93	Monoclonal Antibody based Test for Salmonella enteritidis

Special Research Grants Program
Animal Health Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Tennessee Knoxville, TN 37901-1071	Stephen P. Oliver	90-34116-5339 9002132	\$98,338	09/15/90 09/30/92	Factors Influencing Bovine Mononuclear Cell Function During the Nonlactating Period
University of Tennessee Knoxville, TN 37901-1071	Leon N. Potgieter	90-34116-5377 9002565	\$149,974	08/01/90 07/31/93	Cloning and Sequencing of BRSV G Glycoprotein and Detection of Strain Divergence
Texas A&M Res arch Foundation College Station, TX 77843	D. W. Forrest	90-34116-5287 9002078	\$148,419	09/15/90 09/30/92	Role of Bovine Luteinizing Hormone in Regulation of Anestrus

Special Research Grants Program
Animal Health Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Texas A&M Research Foundation College Station, TX 77843	William R. Klemm	90-34116-5288 9002073	\$150,000	09/01/90 08/31/92	Estrous-Specific Volatiles from Bovine Body Fluids
Texas A&M Research Foundation College Station, TX 77843	James E. Womack	90-34116-5415 9002088	\$150,000	08/01/90 07/31/93	Molecular Genetics of Interferons and Resistance to Bovine Respiratory Disease
University of Wisconsin Madison, WI 53706	Gary A. Splitter	90-34116-5363 9002111	\$150,000	08/01/90 07/31/92	Identification of BHV-1 Proteins by T Cell Immunoblotting

Special Research Grants Program
Animal Health Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Wisconsin Madison, WI 53706	C. J. Czuprynski	90-34116-5368 9002094	\$98,340	08/01/90 07/31/92	Purification, Binding, and Leukocyte Modulation of P. haemolytica leukotoxin
University of Wisconsin Madison, WI 53706	Michael T. Collins	90-34116-5386 9002161	\$56,468	08/01/90 07/31/92	Predictive Value and Economics of Ten Tests for Paratuberculosis
University of Wisconsin Madison, WI 53706	Virginia S. Hinshaw	90-34116-5398 9002286	\$150,000	09/01/90 08/31/93	Avian Mx: A Natural Resistance Gene for Influenza?

TOTAL : \$ 5,340,084

AQUACULTURE RESEARCH

--

The purpose of this program area is to provide and/or improve upon the scientific and technical base needed by the aquaculture industry. This industry has been expanding rapidly. Problems of nutrition, breeding, physiology, management, disease and parasite control are important and are becoming more limiting as the size of the industry and its concentration have increased.

Interest is focused on local and regional problems for which solutions will contribute to national objectives related to aquaculture production.

The specific objective of the research is improved production efficiency through disease and parasite control.

Special Research Grants Program
Aquaculture Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Southern Illinois University Carbondale, IL 62901	James E. Seeb	90-34123-5136 9002228	\$74,027	09/15/90 09/30/92	Improved Performance of Salmonids through Production of Triploid Hybrids
Louisiana State University Agricultural Center Baton Rouge, LA 70894-5203	William H. Brown	89-34123-4509 9003393	\$234,156	06/01/89 11/30/91	Commercial Aquaculture of Crawfish, Red Drum and Striped Bass
University of Mississippi Medical Center Jackson, MS 39216	Jan E. Bly	90-34123-5135 9002221	\$39,441	09/15/90 09/30/92	Winter Kill in Channel Catfish: Temperature, Lipids and Immunity

Special Research Grants Program
Aquaculture Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
North Carolina State University Raleigh, NC 27695-7643	Jeffrey M. Hinshaw	90-34123-5137 9002222	\$36,245	06/01/90 05/31/92	Integration of Biochemical Indicators with Physiological Stress Indices: Application in Trout Aquaculture
Univ. of Rhode Island Kingston, RI 02881	George C. Tremblay	90-34123-5139 9002236	\$69,855	09/01/90 08/31/92	Effect of Carnitine on Growth and Ammonia Toxicity in Atlantic Salmon
Washington State University Pullman, WA 99164-1030	Sandra S. Ristow	90-34123-5138 9002233	\$80,000	08/15/90 08/31/92	Cellular Aspects of Resistance to Rhabdoviruses in Salmonids

TOTAL : \$ 533,724

RANGELAND RESEARCH GRANTS PROGRAM

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Rangeland Research grants are awarded to support basic research in certain areas of rangeland research such as: (1) management of rangelands as integrated systems, (2) methods of managing rangeland watersheds to maximize efficient use of riparian areas and water and to improve water yield, water quality, and water conservation, and (3) revegetation and rehabilitation of rangeland including the control of undesirable species of plants.

Rangeland Research Grants Program
Rangeland Research Grants

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Idaho Moscow, ID 83843	Steven J. Brunsfeld	90-38300-5299 9001430	\$60,000	07/01/90 10/31/92	Molecular Genetics and Ecology of Bitterbrush
Montana State University Bozeman, MT 59717	Clayton B. Marlow	90-38300-5095 9001436	\$32,000	09/01/90 08/30/92	Refinement of the Cesium Tracer Technique for Monitoring Soil Erosion
University of Nevada Reno, NV 89557-0025	Robert S. Nowak	90-38300-5096 9001420	\$75,000	09/01/90 08/31/93	Plant-Soil-Water Relationships of Riparian Graminoids

Rangeland Research Grants Program
Rangeland Research Grants

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Oregon State University Corvallis, OR 97331	Martin Vavra	90-38300-5309 9001432	\$65,000	09/01/90 03/31/94	Identifying Livestock and Forage Responses to Winter Grazing in the Northern Great Basin
Oregon State University Corvallis, OR 97331	Peter B. McEvoy	90-38300-5310 9001455	\$27,000	07/01/90 06/30/91	Reliability of Weed Control by Exotic Insects
Oregon State University Corvallis, OR 97331	James A. Moore	90-38300-5311 9001445	\$55,000	09/01/90 02/28/93	Impact of Waterer Location on the Bacterial Quality of Rangeland Streams

Rangeland Research Grants Program
Rangeland Research Grants

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Texas A&M University System College Station, TX 77843	David D. Briske	90-38300-5097 9001412	\$63,243	09/01/90 08/31/93	Mechanisms Regulating Axillary Bud Growth in Perennial Grasslands
Utah State University Logan, UT 84322	Neil West	90-38300-5098 9001426	\$72,000	09/01/90 08/31/94	Stability of Plant Community Composition and Yield in Sagebrush Steppe Relicts

TOTAL : \$ 449,243

FOOD AND AGRICULTURAL SCIENCES NATIONAL NEEDS
GRADUATE FELLOWSHIPS GRANT PROGRAM

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This program was initiated because of increasing concern about growing shortages of trained professionals in the food and agricultural sciences. The objective of the program is to encourage outstanding students (U.S. citizens) to pursue and complete a graduate degree in an area of the food and agricultural sciences for which there is a national need for the development of scientific expertise. The fiscal year 1990 program consisted of grants to colleges and universities with superior graduate teaching and research programs in the targeted areas of the food and agricultural sciences. Fellowships were awarded in the following areas in fiscal year 1990:

Biotechnology	\$ 576,000
Engineering--Food, Forest Products, or Agricultural	528,000
Marketing or Management--Food, Forest Products, or Agribusiness	523,520
Food Science/Human Nutrition	576,000
Water Sciences	<u>528,000</u>
	\$2,731,520

This program is administered under the authority of Section 1417(a)(3)(B) of P.L. 95-113, as amended (7 U.S.C. 3152). Eligible institutions include all U.S. colleges and universities which confer a graduate degree in an area of the food and agricultural sciences targeted for national needs fellowships.

National Needs Graduate Fellowships Program
Biotechnology, Animal

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	FELLOWSHIPS SUPPORTED
Colorado State University Fort Collins, CO 80523	Gordon D. Niswender	90-38420-5242 9003116	\$96,000	09/01/90 08/31/95	2 Doctoral
University of Missouri Columbia, MO 65211	R. Michael Roberts	90-38420-5246 9003105	\$96,000	09/01/90 08/31/95	2 Doctoral
University of Wisconsin Madison, WI 53706	Gary A. Splitter	90-38420-5254 9002965	\$96,000	09/01/90 08/31/95	2 Doctoral

TOTAL \$288,000

National Needs Graduate Fellowships Program
Biotechnology, Plant

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	FELLOWSHIPS SUPPORTED	
University of Missouri Columbia, MO 65211	Douglas D. Randall	90-38420-5226 9003103	\$96,000	09/01/90 08/31/95	2	Doctoral
Cornell University Ithaca, NY 14853	Steven V. Beer	90-38420-5247 9002993	\$96,000	09/01/90 08/31/95	2	Doctoral
Pennsylvania State University University Park, PA 16802	Hector E. Flores	90-38420-5230 9003091	\$96,000	09/01/90 08/31/95	2	Doctoral

TOTAL \$288,000

National Needs Graduate Fellowships Program
Agriculture Engineering

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	FELLOWSHIPS SUPPORTED
University of Florida Gainesville, FL 32611	J. Wayne Mishoe	90-38420-5204 9003087	\$96,000	09/01/90 08/31/95	2 Doctoral
University of Missouri Columbia, MO 65211	Steven J. Mulvaney	90-38420-5225 9003034	\$96,000	09/01/90 08/31/95	2 Doctoral
University of Nebraska Lincoln, NE 68588-0430	James A. DeShazer	90-38420-5200 9003074	\$96,000	09/01/90 08/31/95	2 Doctoral

National Needs Graduate Fellowships Program
Agriculture Engineering

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	FELLOWSHIPS SUPPORTED
Pennsylvania State University University Park, PA 16802	Dennis E. Buffington	90-38420-5249 9003008	\$96,000	09/01/90 08/31/95	2 Doctoral
University of Tennessee Knoxville, TN 37901-1071	Luther R. Wilhelm	90-38420-5250 9003019	\$96,000	09/01/90 08/31/95	2 Doctoral
Virginia Polytechnic Institute and State University Blacksburg, VA 24061	James D. Dolan	90-38420-5252 9003012	\$48,000	09/01/90 08/31/95	1 Doctoral

TOTAL : \$ 528,000

National Needs Graduate Fellowships Program
Food, Forest Products, or Agribusiness Mktg.

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	FELLOWSHIPS SUPPORTED	
Oregon State University Corvallis, OR 97331	Steven T. Buccola	90-38420-5229 9003083	\$96,000	09/01/90 08/31/95	2	Doctoral
Virginia Polytechnic Institute and State University Blacksburg, VA 24061	Robert J. Bush	90-38420-5232 9002978	\$96,000	09/01/90 08/31/95	2	Doctoral
Virginia Polytechnic Institute and State University Blacksburg, VA 24061	Wayne D. Purcell	90-38420-5253 9003013	\$96,000	09/01/90 08/31/95	2	Doctoral

TOTAL : \$ 523,520

National Needs Graduate Fellowships Program
Food, Forest Products, or Agribusiness Mktg.

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	FELLOWSHIPS SUPPORTED
Purdue Research Fdn. West Lafayette, IN 47907	Jay T. Akridge	90-38420-5201 9003037	\$96,000	09/01/90 08/31/95	2 Doctoral
Kansas State University Manhattan, KS 66506	Barry K. Goodwin	90-38420-5244 9003032	\$91,520	09/01/90 08/31/95	2 Doctoral
University of Minnesota St. Paul, MN 55108	Jean D. Kinsey	90-38420-5245 9003084	\$48,000	09/01/90 08/31/95	1 Doctoral

National Needs Graduate Fellowships Program
Food Science

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	FELLOWSHIPS SUPPORTED
University of Illinois Champaign, IL 61820	Bruce M. Chassy	90-38420-5223 9003089	\$96,000	09/01/90 08/31/95	2 Doctoral
University of Minnesota St. Paul, MN 55108	Francis F. Busta	90-38420-5224 9003022	\$96,000	09/01/90 08/31/95	2 Doctoral
Pennsylvania State University University Park, PA 16802	Stephanie Doores	90-38420-5231 9002961	\$96,000	09/01/90 08/31/95	2 Doctoral

TOTAL \$288,000

National Needs Graduate Fellowships Program
Human Nutrition

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	FELLOWSHIPS SUPPORTED	
University of California Davis, CA 95616	Robert B. Rucker	90-38420-5241 9002988	\$96,000	09/01/90 08/31/95	2	Doctoral
University of Georgia Research Foundation, Inc. Athens, GA 30602	Carolyn D. Berdanier	90-38420-5243 9003004	\$96,000	09/01/90 08/31/95	2	Doctoral
University of Wisconsin Madison, WI 53706	John W. Suttie	90-38420-5255 9003076	\$96,000	09/01/90 08/31/90	2	Doctoral

TOTAL \$288,000

National Needs Graduate Fellowships Program
Water Science

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	FELLOWSHIPS SUPPORTED
Michigan State University East Lansing, MI 48824	Frank M. D'Itri	90-38420-5203 9003104	\$96,000	09/01/90 08/31/95	2 Doctoral
North Carolina State University Raleigh, NC 27695-7003	R. W. Skaggs	90-38420-5248 9002983	\$96,000	09/01/90 08/31/95	2 Doctoral
University of Nebraska Lincoln, NE 68588-0430	Derrel L. Martin	90-38420-5227 9002998	\$96,000	09/01/90 08/31/95	2 Doctoral

National Needs Graduate Fellowships Program
Water Science

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	FELLOWSHIPS SUPPORTED
Oklahoma State University Stillwater, OK 74078-0500	Bruce N. Wilson	90-38420-5228 9003023	\$96,000	09/01/90 08/30/85	2 Doctoral
Texas A&M Research Foundation College Station, TX 77843	Donald L. Reddell	90-38420-5202 9003072	\$96,000	09/01/90 08/31/95	2 Doctoral
Utah State University Logan, UT 84322	Christopher M. Neale	90-38420-5251 9003036	\$48,000	09/01/90 08/31/95	1 Doctoral

TOTAL : \$ 528,000

1890 INSTITUTION CAPACITY BUILDING GRANTS PROGRAM

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The objective of this program is to advance the teaching and research capabilities of the 1890 Land-Grant Institutions and Tuskegee University through cooperative initiatives with Federal and non-Federal entities. This program addresses the need to (1) attract more minority students into the food and agricultural sciences, (2) expand the linkages among the 1890 Institutions and with other colleges and universities, and (3) strengthen the overall capacity of the 1890 Land-Grant Institutions to more firmly establish them as full partners in the food and agricultural science and education system. Teaching projects addressed the following targeted need areas: curricula design and materials development, faculty preparation and enhancement, instruction delivery systems, student experiential learning, instrumentation for teaching, and student recruitment and retention.

Research projects addressed high-priority initiatives where there is a present or anticipated need for increased capabilities, such as studies and experimentation in the food and agricultural sciences, the establishment of centralized research support systems, and the development of improved technology delivery systems for producers and consumers. Funds to support research and teaching projects were used as follows:

Research grants	\$3,544,380
Teaching grants	<u>1,722,720</u>
	\$5,267,100

This program is administered under the authority contained in Section 1472 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977, as amended (7 U.S.C. 3318). Eligible institutions include the sixteen 1890 Land-Grant Institutions and Tuskegee University.

1890 Capacity Building Grants Program
Capacity Building Grants, Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Alabama A&M University Normal, AL 35762	D. R. Rao	90-38814-5535 9003378	\$340,047	09/01/90 08/31/92	Capacity Building in Food Biotechnology Research
Tuskegee University Tuskegee, AL 36088	Ralphenia D. Pace	90-38814-5490 9003303	\$281,723	09/01/90 08/31/93	Center for Research on Diet, Life Style and Cardiovascular Disease in Rural Black Alabamians
Florida A&M University Tallahassee, FL 32307	Ralph W. Flowers	90-38814-5491 9003337	\$329,154	09/01/90 08/31/93	A Biotic Index for Monitoring Water Quality: Coastal Plains Ecosystems

1890 Capacity Building Grants Program
Capacity Building Grants, Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Fort Valley State College Fort Valley, GA 31030	Seyoum Gelaye	90-38814-5493 9003272	\$202,977	09/01/90 08/31/93	Yield, Chemical Composition and Nutritional Values of Alfalfa, Kudzu and Rhizoma Peanut
Kentucky State University Frankfort, KY 40601	Carl D. Webster	90-38814-5494 9003358	\$90,473	09/01/90 09/30/91	Growth and Lipid Content of Catfish Fed Diets Utilizing Local Feedstuffs
Kentucky State University Frankfort, KY 40601	Karan Kaul	90-38814-5495 9003373	\$94,326	09/01/90 08/31/93	Management of Reflected Light for Enhancement of Yields in Horticultural Crops

1890 Capacity Building Grants Program
Capacity Building Grants, Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Kentucky State University Frankfort, KY 40601	Myna Panemangalore	90-38814-5540 9003389	\$181,724	09/01/90 08/31/93	Evaluation of Biomarkers of Zinc and Copper Status in Animals and Humans
Southern University Baton Rouge, LA 70813	Alonzo Chappell	90-38814-5542 9003294	\$338,781	09/01/90 08/31/93	Effects of Age of Weaning and Nutrition on the Performance of Beef Cattle
Southern University Baton Rouge, LA 70813	Bernestine B. McGee	90-38814-5543 9003278	\$158,575	09/01/90 08/31/92	Enhancement of Nutrition Research Capacity of Southern University

1890 Capacity Building Grants Program
Capacity Building Grants, Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Maryland - Eastern Shore Princess Anne, MD 21853	J. M. Harter-Dennis	90-38814-5496 9003285	\$278,456	09/01/90 08/31/92	Manipulation and Non- Invasive Measurement of Lean Fat Ratio in Broiler Chickens
University of Maryland - Eastern Shore Princess Anne, MD 21853	Thomas S. Handwerker	90-38814-5545 9003284	\$319,353	09/01/90 08/31/93	Aquaculture Research Center for Water Quality and Effluent Management in Aquatic Systems
Lincoln University Jefferson City, MO 65101	Myung S. Chi	90-38814-5546 9003318	\$158,575	09/01/90 08/31/92	Effects of Dietary n-3 Fatty Acids on Hypertension and Lipid Metabolism

1890 Capacity Building Grants Program
Capacity Building Grants, Research

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
North Carolina A&T State University Greensboro, NC 27411	John W. Allen	90-38814-5548 9003385	\$154,154	09/01/90 08/31/93	Development of a Hybridoma Facility
Tennessee State Univ. Nashville, TN 37209-1561	Robert E. Harrison	90-38814-5550 9003391	\$338,900	09/01/90 08/31/92	Entomopathogenic Nematodes as Biocontrol Agents of Japanese Beetle in Tennessee
Prairie View A&M University Prairie View, TX 77446-2886	Godson O. Osuji	90-38814-5497 9003332	\$177,162	09/01/90 08/31/92	Enhancement of the Protein Contents of Sweet Potato, Corn, and Rice Through Biotechnology

TOTAL : \$ 3,444,380

1890 Capacity Building Grants Program
Capacity Building Grants, Teaching

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Alabama A&M University Normal, AL 35762	James W. Shuford	90-38814-5489 9003375	\$173,805	09/01/90 08/31/92	Recruitment, Retention and Student Experiential Learning in Agriculture
University of Arkansas Pine Bluff, AR 71601	Edith G. Neal	90-38814-5536 9003352	\$173,513	09/01/90 08/31/91	Strengthening the Quality and Effectiveness of Educational Delivery Systems
University of Arkansas Pine Bluff, AR 71601	Jacquelyn W. McCray	90-38814-5537 9003299	\$173,573	09/01/90 08/31/93	Curriculum Development: Bachelors Degree in Regulatory Sciences

1890 Capacity Building Grants Program
Capacity Building Grants, Teaching

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Florida A&M University Tallahassee, FL 32307	Zacch I. Olorunnipa	90-38814-5538 9003336	\$174,012	09/01/90 08/31/93	Minority Human Capital Development in Agribusiness at Florida A&M University
Florida A&M University Tallahassee, FL 32307	Judith M. McDowell	90-38819-5539 9003315	\$174,015	09/01/90 08/31/93	Enhancement and Preparation for Teaching Faculty in the Plant Sciences Program
Fort Valley State College Fort Valley, GA 31030	Kashmiri L. Arora	90-38814-5492 9003267	\$157,907	09/01/90 08/31/93	Diversifying Career Opportunities for Veterinary Technology Graduates at Fort Valley State College

1890 Capacity Building Grants Program
Capacity Building Grants, Teaching

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Kentucky State University Frankfort, KY 40601	E. Terry Magel	90-38814-5541 9003313	\$174,015	09/01/90 08/31/93	Mobile Computer Laboratory for Rural Development
University of Maryland - Eastern Shore Princess Anne, MD 21853	Ejigou Demissie	90-38814-5514 9003282	\$173,916	09/01/90 08/31/92	Center for AgriBusiness Studies
Lincoln University Jefferson City, MO 65101	Lurline Marsh	90-38814-5547 9003367	\$79,394	09/01/90 08/31/92	Enhancing Instrumentation and Faculty Preparation in Plant and Soil Science

1890 Capacity Building Grants Program
Capacity Building Grants, Teaching

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
South Carolina State College Orangeburg, SC 29117	Haile Selassie	90-38814-5549 9003344	\$168,570	09/01/90 08/31/92	A Qualitative and Quantitative Enhancement of M. S. and B.S. Programs in Agribusiness

TOTAL : \$ 1,622,720

1890 Capacity Building Grants Program
Capacity Building Grants, Planning

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Delaware State College Dover, DE 19901	Bernard R. Petrosky	90-38814-5692 9003301	\$50,000	09/01/90 08/31/91	Aquaculture Research Extension Capability Enhancement
Alcorn State University Lorman, MS 39096	Liang C. Huam	90-38814-5693 9003316	\$50,000	09/01/90 08/31/91	Development of an International Agricultural Option and Degree Program
Langston University Langston, OK 73050	Tilahun Sahlu	90-38814-5694 9003286	\$50,000	09/01/90 08/31/91	The Use of Stable Isotopes to Measure Goat Nutritional Status

1890 Capacity Building Grants Program
Capacity Building Grants, Planning

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE

Virginia State University Petersburg, VA 23803	Conrad M. Gilliam	90-38814-5695 9003307	\$50,000	09/01/90 08/31/91	Building Institutional Capacity for Student Recruitment and Retention

TOTAL : \$ 200,000

HIGHER EDUCATION CHALLENGE GRANTS PROGRAM

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The objective of this new competitive grants program is to stimulate and enable U.S. colleges and universities to provide the highest quality education necessary to produce graduates in the food and agricultural sciences capable of strengthening the Nation's scientific and professional workforce. The program is designed to enhance college and university degree programs in the food and agricultural sciences. It is intended that projects supported by the program will: (1) address a regional, national, or otherwise significant higher education problems; (2) involve a creative or novel approach toward solving the problems which can serve as a model to others; (3) encourage and facilitate better working relationships in the university science and education community, as well as between universities and the private sector, to enhance program quality and supplement available resources; and (4) result in benefits which will likely transcend the project duration and USDA support.

In FY 1990, the \$957,390 available for this program were used to support undergraduate instruction projects in the following targeted need areas:

- Curricula Design and Materials Development
- Faculty Preparation and Enhancement
- Utilization of Innovative Instruction Delivery Systems
- Student Experiential Learning

This program is administered under the authority contained in Section 1417(a) (2) (A) of the National Agricultural Research, Extension, and Teaching Policy Act of 1977, as amended (7U.S.C. 3152). Eligible institutions include the U.S. Land-Grant Colleges and Universities and other U.S. Colleges and Universities that have demonstrable capacity to carry out teaching in the food and agricultural sciences and business.

Challenge Grants Program
Higher Education Challenge Grants Program

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Tuskegee University Tuskegee, AL 36088	Beatrice W. Phillips	90-38411-5743 9003642	\$45,675	09/15/90 09/30/92	Strengthening Teaching Programs in Foods and Nutritional Sciences
University of California Davis, CA 95616	Roger E. Garrett	90-38411-5734 9003524	\$43,163	09/15/90 09/30/91	Improvement of Competencies of Agricultural and Related Biological Engineers
California State University Fresno, CA 93740	Gary L. Riley	90-38411-5737 9003560	\$45,675	09/15/90 09/30/91	Advanced Learning Technology in Animal, Plant and Human Nutritional Science

Challenge Grants Program
Higher Education Challenge Grants Program

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of California Riverside, CA 92521	Lanny J. Lund	90-38411-5727 9003619	\$45,578	09/15/90 09/30/92	Agriculture and the Environment: A Field Course in Data Acquisition and Analysis
Colorado State University Fort Collins, CO 80523	K.A. Oltjenbruns	90-38411-5728 9003634	\$45,665	09/15/90 09/30/92	Model for Multicultural Perspective in Home Economics Curriculum
University of Delaware Newark, DE 19711	Thomas A. Evans	90-38411-5733 9003615	\$45,675	09/15/90 09/30/93	Development of Interactive Videodisc Technology for Teaching Plant Pathology

Challenge Grants Program
Higher Education Challenge Grants Program

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Florida Gainesville, FL 32611	H. Evan Drummond	90-38411-5735 9003576	\$45,675	09/15/90 09/30/91	Expanding Agriscience Education: Delivery of Satellite Instruction Technology
University of Georgia Research Foundation, Inc. Athens, GA 30602	E. Dale Theadgill	90-38411-5731 9003489	\$39,555	09/15/90 09/30/93	Enhancement of Undergraduate Engineering Education via a True Design Experience
University of Hawaii at Manoa Honolulu, HI 96822	Sylvia Yuen	90-38411-5739 9003571	\$45,675	09/15/90 09/30/91	A Model International Experience in the Food and Agricultural Sciences

Challenge Grants Program
Higher Education Challenge Grants Program

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
University of Illinois Urbana, IL 61801	William L. George	90-38411-5730 9003528	\$45,675	09/15/90 09/30/91	Summer Research Program for Minority Undergraduate Students
University of Illinois Urbana, IL 61801	Steven T. Sonka	90-38411-5788 9003548	\$29,325	09/15/90 09/30/91	Enhancing Managerial Education to Attract Young Men and Women to Agribusiness
Purdue Research Fdn. West Lafayette, IN 47907	David W. Downey	90-38411-5742 9003578	\$45,640	09/15/90 09/30/93	Undergraduate Agri selling Course via AG*SAT

Challenge Grants Program
Higher Education Challenge Grants Program

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Purdue Research Fdn. West Lafayette, IN 47907	Larry T. Glickman	90-38411-5789 9003577	\$22,020	09/15/90 09/30/91	An Interdisciplinary Curriculum on Animal Welfare and Societal Concerns
Kansas State University Manhattan, KS 66506	Arlo W. Biere	90-38411-5738 9003506	\$43,991	09/15/90 09/30/93	Enhancing the Agribusiness Experience of Agricultural Economics Faculty
Kansas State University Manhattan, KS 66506	Paul E. Neumann	90-38411-5790 9003508	\$31,009	09/15/90 09/30/92	Extrusion Processing in the Food and Feed Industries

Challenge Grants Program
Higher Education Challenge Grants Program

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Michigan State University East Lansing, MI 48824	B.J. Sternquist	90-38411-5729 9003557	\$45,675	09/15/90 09/30/92	International Food Distribution Systems: A Video Study
North Carolina State University Raleigh, NC 27695-7003	J. Douglas Wellman	90-38411-5732 9003558	\$45,675	09/15/90 09/30/91	Partnerships for Low cost, Interactive, Multi-media Distance Education in Forestry
University of Nebraska Lincoln, NE 68588-0430	Jack G. McBride	90-38411-5736 9003504	\$45,675	09/15/90 09/30/91	Development of an Agricultural Satellite Network for Resident Instruction

Challenge Grants Program
Higher Education Challenge Grants Program

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Oregon State University Corvallis, OR 97331	Sandra A. Helmick	90-38411-5791 9003540	\$22,019	09/15/90 09/30/91	A Faculty Development Model for Writing Across the Home Economics Curriculum
Pennsylvania State University University Park, PA 16802	Lowell D. Satterlee	90-38411-5741 9003650	\$33,476	09/15/90 09/30/91	Introduction to Food Science - A Satellite Course
Texas A&M Research Foundation College Station, TX 77843	Donald M. Vietor	90-38411-5740 9003520	\$42,923	09/15/90 09/30/91	Ethics in Agriculture: A Holistic and Experiential Approach

Challenge Grants Program
Higher Education Challenge Grants Program

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Texas A&M Research Foundation College Station, TX 77843	Kerry K. Litzenberg	90-38411-5792 9003516	\$22,020	09/15/90 09/30/91	Enhancing Agribusiness Education at Texas A&M University
Texas A&I University Kingsville, TX 78363	James D. Arnold	90-38411-5726 9003480	\$45,675	09/15/90 09/30/91	Faculty Transculturation for Teaching in an Equally Bicultural Environment
Utah State University Logan, UT 84322	Jeffrey L. Walters	90-38411-5744 9003542	\$34,256	09/15/90 09/30/92	Development of an AG SAT Animal Genetics Course

TOTAL : \$ 957,390

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The objectives of this program are to stimulate technological innovation in the private sector, to strengthen the role of small business in meeting Federal research and development needs, to increase private sector commercialization and development efforts, and to encourage participation of small and disadvantaged firms in technological innovation.

The program emphasizes support of high-quality research and development proposals containing advanced concepts related to important agricultural problems and opportunities that could lead to significant public benefits. The areas considered in this program are broad and encompass a wide range of agricultural sciences. The subtopics include: (1) forests and related resources, (2) plant production and protection, (3) animal production and protection, (4) air, water, and soils, (5) food science and nutrition, (6) rural and community development, and (7) Aquaculture.

In fiscal year 1990, USDA awarded both Phase I and Phase II grants. Phase I grants are primarily for research designed to determine technical feasibility of the proposed approach or concept. Phase II grants are awarded to those Phase I projects that have shown sufficient promise for further support. The total amount awarded in fiscal year 1990 was \$4,106,091.

Small Business Innovation Research Program
Forests & Related Resources

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Bio-Eng, Inc. 216 Sylvia Street Arlington, MA 02174	Trevor P. Castor	90-33610-5111 9000015	\$50,000	05/15/90 11/30/90	Supercritical Fluid Comminution of Biomass
Minn-Vitro, Inc. 1520 Albany Avenue St. Paul, MN 55108	Kathryn Louis	90-33610-5029 9000018	\$49,683	05/15/90 11/30/90	Maximizing Shoot Forming Efficiency of Populus using In Vitro Micro-Cross Sections
General Pneumatics Corporation 440 Washington Street Orange, NJ 07050	Ernest E. Atkins	90-33610-5467 9001096	\$175,000	09/01/90 08/31/92	Wood-Fired, Air Charged, Ross - Stirling 3kW Power System

Small Business Innovation Research Program
Forests & Related Resources

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Drying Solutions 12 N. W. Edgewood Drive Corvallis, OR 97330	Stewart Holmes	90-33610-5635 9001129	\$240,000	09/01/90 08/31/92	A Weight-Based Technology for Monitoring the Moisture Content of Lumber
Mycorr Tech, Inc. 440 William Pitt Way Pittsburgh, PA 15238	Stephen B. Maul	90-33610-5466 9001196	\$190,000	09/01/90 08/31/92	Ectomycorrhizal Fungi Adapted to Arid Alkaline Soils
Lynnntech, Inc. 111 E. 27th St., Suite 204 Bryan, TX 77803	Oliver J. Murphy	90-33610-5101 9000028	\$50,000	05/15/90 11/30/90	Electrochemical Conversion of Lignin- Derived Polymeric Materials to Valuable Chemicals

Small Business Innovation Research Program
Forests & Related Resources

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Hawkins & Powers Aviation Gene Powers Inc. P.O. Box 391 Greybull, WY 82426		90-33610-5072 9000007	\$47,981	05/15/90 11/30/90	Aerial Firefighting Retardent Application Systems

TOTAL : \$ 802,664

Small Business Innovation Research Program
Plant Production & Protection

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
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Calgene, Inc. 1920 Fifth Street Davis, CA 95616	Donna H. Mitten	90-33610-5687 9001195	\$209,933	09/15/90 09/30/92	Production of Large In Vitro Tubers for Direct Field Planting
DNA Plant Technologies, Inc. 6701 San Pablo Avenue Oakland, CA 94608	Diane Burgess	90-33610-5141 9000063	\$49,038	05/15/90 11/30/90	Characterization of a Nuclear Male Sterile Gene Isolated by Transposon-Tagging
LandTechnic, Inc. 8715 N.W. 4th Place Gainesville, FL 32607	Lawrence N. Shaw	90-33610-5114 9000071	\$49,500	05/15/90 11/30/90	Automatic Transplanter for Crops and Trees

Small Business Innovation Research Program
Plant Production & Protection

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Transducer Research, Inc. 1228 Olympus Dr. Naperville, IL 60540	Joseph R. Stetter	90-33610-5088 9000050	\$50,000	05/15/90 11/30/90	Detection and Identification of Foreign Odors in Grain
Agrobotics, Inc. P.O. Box 2728 West Lafayette, IN 47906	Stephen M. Beam	90-33610-5100 9000084	\$50,000	05/15/90 11/30/90	Robotic Transplanting
International Health Technologies, Inc. 11239 Peartree Way, Suite E Columbia, MD 21044	William K. Journey	90-33610-5033 9000046	\$49,837	05/15/90 11/30/90	Mississippi Aquatic Feed Project

Small Business Innovation Research Program
Plant Production & Protection

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE

ECOCHEM Research, Inc. 11 Peavey Road Chaska, MN 55318	Robert E. Carlson	90-33610-5049 9000100	\$49,803	05/15/90 11/30/90	Flavonoid Probes for Rhizobium/Legume Nodulation Studies
American Eagle Fuels, Inc 1221 N Street, Suite 700 Lincoln, NE 68508	William A. Scheller	90-33610-5102 9000315	\$50,000	05/15/90 11/30/90	Production and Characterization of ETBE from Hydrous Ethanol in a Lab Scale Microunit
Bend Research, Inc. 64550 Research Rd. Bend, OR 97701-8599	Scott M. Herbig	90-33610-5794 9001128	\$205,000	09/15/90 09/30/92	Development of Long- Lasting Codling Moth Granulosis Virus Formulation

Small Business Innovation Research Program
Plant Production & Protection

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Briggs Nursery, Inc. 4407 Henderson Blvd. Olympia, WA 98501	Bruce A. Briggs	90-33610-5131 9000067	\$50,000	05/15/90 11/30/90	Investigation of a Closed, Insulated Pallet for Growing Nursery Plants

TOTAL : \$ 813,111

Small Business Innovation Research Program
Animal Production & Protection

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Arizona Biotechnology Corporation 1430 E. Fort Lowell Rd. Tucson, AZ 85719-2366	Mary E. Mapother	90-33610-5463 9001095	\$180,000	09/15/90 09/30/92	A Sensitive Diagnostic Test for Swine Dysentery Using the Polymerase Chain Reaction
BioGrowth, Inc. 3605 Atlas Road, Suite 117 Richmond, CA 94806	Sharon K. Spratt	90-33610-5108 9000158	\$50,000	05/15/90 11/30/90	Bovine IGF Carrier Protein to Enhance Growth, Milk Production and Wound Healing
Immusine, Inc. 1933 Davis Street, Suite 226 San Leandro, CA 94577	William R. Usinger	90-33610-5019 9000123	\$48,850	05/15/90 11/30/90	Growth Stimulation of Chickens by a Bacterial Polysaccharide

Small Business Innovation Research Program
Animal Production & Protection

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Athens Research and Technology, Inc. P.O. Box 5494 Athens, GA 30604	Paula G. Ciembor	90-33610-5798 9001103	\$225,000	09/15/90 09/30/92	A Quick Diagnostic Test to Detect a Deadly Bacteria Infecting Channel Catfish
Biomat Feeding Systems, Inc. 1801 Maple Avenue Evanston, IL 60201-3135	Carl W. Hirschinger	90-33610-5128 9000145	\$48,850	05/15/90 11/30/90	A Computerized Hog Feeding Process for Improved Feed Conversion and Growth Rate
Data Sciences, Inc. 2678 Patton Rd. Roseville, MN 55113-1136	Perry A. Mills	90-33610-5065 9000130	\$50,000	05/15/90 11/30/90	A System for Automated Detection of Ovulation in Dairy Cows

Small Business Innovation Research Program
Animal Production & Protection

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE

Embrex, Inc. P.O. Box 13989 Res Triangle Pk, NC	R. P. Gildersleeve 27709-3989	90-33610-5024 9000150	\$49,913	05/15/90 11/30/90	Automated System for Poultry Embryo Viability Detection

TOTAL : \$ 652,613

Small Business Innovation Research Program
Air, Water, & Soils

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Sonoma Research Company P.O. Box 116 Vineburg, CA 95487	Oleh Weres	90-33610-5051 9000174	\$49,645	05/15/90 11/30/90	Electrochemical Process for Destroying Pesticide Waste
Sensit Company 1226 Milner Lane Longmont, CO 80501	Paul H. Stockton	90-33610-5569 9001078	\$225,000	09/01/90 08/31/92	Field Instrument for Wind Eroding Soil
Perfect View, Inc. 3909 Beryl Road Raleigh, NC 27607	A. J. Attar	90-33610-5464 9001098	\$125,000	09/01/90 08/31/92	Accurate, Low-Cost Devices for Water Quality Control

Small Business Innovation Research Program
Air, Water, & Soils

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Daniel B. Stephens & Associates, Inc. 4415 Hawkins, NE Albuquerque, NM 87109	Daniel B. Stephens	90-33610-5047 9000190	\$49,900	05/15/90 11/30/90	Development of a Deep Borehole Permeameter to Determine Unsaturated Hydraulic Properties
Intercomp Rt. 3, Box 212 Stillwater, OK 74074	James N. Lange	90-33610-5465 9001102	\$150,000	09/01/90 08/31/92	High Resolution Soil Water Content Profiling
Hobson Manufacturing, Inc 3720 Clark Blvd. Ontario, OR 97914	Joe Hobson	90-33610-5127 9000192	\$48,964	05/15/90 11/30/90	Mechanical Straw Mulching to Reduce Phosphorous Pollution in Irrigation Run-Off Water

TOTAL : \$ 648,509

Small Business Innovation Research Program
Food Science & Nutrition

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
KDC Technology Corp. 2011 Research Drive Livermore, CA 94550	Ray J. King	90-33610-5043 9000218	\$50,000	05/15/90 11/30/90	On-Line and Insitu Moisture Measurement in Grains Using Microwaves
Perishables Research Organization 1856-4 Cherokee Drive Salinas, CA 93906	Richard E. Woodruff	90-33610-5600 9001097	\$220,000	09/01/90 08/31/92	Use of Membrane Air Separator Technology for Transport of Fresh Produce
Universal Sensors, Inc. P.O. Box 736 New Orleans, LA 70148	Ahmad Suleiman	90-33610-5599 9001100	\$170,000	09/01/90 08/31/92	Fiber-Optic Biosensors in Food Analysis

Small Business Innovation Research Program
Food Science & Nutrition

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Allied Energy Systems, Inc. 400 Fifth Avenue Waltham, MA 02154	David R. Whitlock	90-33610-5570 9001101	\$215,000	09/01/90 08/31/92	Removal of Bran from Wheat Flour
Camas Diagnostic Company 1313 5th St., SE Minneapolis, MN 55414	Peter Nash	90-33610-5071 9000193	\$50,000	05/15/90 11/30/90	Visual Method for Rapid Detection of Foodborne Pathogens
BIOGAIA BIOLOGICS, Inc. 8606 Jersey Court Raleigh, NC 27613	Ivan A. Casas	90-33610-5048 9000207	\$49,160	05/15/90 11/30/90	Development of a Reuterin-Based Food Preservation Technology

TOTAL : \$ 754,160

Small Business Innovation Research Program
Rural & Community Development

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
David M. Dornbusch & Company, Inc. 1736 Stockton Street San Francisco, CA 94133	David M. Dornbusch	90-33610-5053 9000242	\$44,591	05/15/90 11/30/90	Self-Supporting Programs to Promote Rural Business and Economic Development
Telident, Inc. 4510 W. 77th Street Edina, MN 55435	Martin D. Moody	90-33610-5068 9000231	\$50,000	05/15/90 11/30/90	Developing Equipment which will bring E911 to Rural America
XMCO, Inc. 460 Spring Park Place Herndon, VA 22070-5215	Charles J. Garvey	90-33610-5130 9000236	\$49,237	05/15/90 11/30/90	County Agent Advisor System (CAAS)

Small Business Innovation Research Program
Rural & Community Development

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Glenn H. Woods Corp. Box 72 Bridgewater, VT 05034	Louise Wall	90-33610-5129 9000241	\$50,000	05/15/90 11/30/90	Intergenerational Community Care: A Revenue Generating Opportunity for Rural America

TOTAL : \$ 193,828

Small Business Innovation Research Program
Aquaculture

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Berkeley Antibody Company (BAbCO), Inc. 4131 Lakeside Drive, Suite B Richmond, CA 94806-1965	Thomas R. Anderson	90-33610-5074 9000290	\$50,000	05/15/90 11/30/90	Antibodies Specific for Growth Hormone/ Prolactin Isoforms in Tilapia
Hawaii Aquaculture Company, Inc. 1103 9th Avenue, Suite 206 Honolulu, HI 96816	Spencer R. Malecha	90-33610-5073 9000301	\$49,251	05/15/90 11/30/90	Development of Sex Reversal Technology for Cultured Marine Shrimp and Freshwater Prawn Broodstock
Aquaculture Technology 455 Anolani Street Honolulu, HI 96821-2032	Jaw-Kai Wang	90-33610-5109 9000271	\$50,000	05/15/90 11/30/90	Development of an Economically Competitive Oyster/ Shrimp Production System

Small Business Innovation Research Program
Aquaculture

GRANTS AWARDED FOR FISCAL YEAR 1990

ORGANIZATION	PRINCIPAL INVESTIGATOR	GRANT NUMBER PROPOSAL NUMBER	AMOUNT	AGREEMENT PERIOD FROM TO	TITLE
Bay Port Fish Company, Inc. 1008 First Street Bay Port, MI 48720	Forrest N. Williams	90-33610-5142 9000289	\$41,955	05/15/90 11/30/90	Evaluation of a Filter Press System to Reduce Moisture Content of Fish Production Wastes
MariGenetics, Inc. P.O. Box 1809 Corvallis, OR 97339	H. M. Engelking	90-33610-5044 9000300	\$50,000	05/15/90 11/30/90	Use of Combinations of IHNV Subunit Clones to Provide Enhanced Immunity in Trout

TOTAL : \$ 241,206

SCIENTISTS WHO SERVED ON USDA/CSRS PEER REVIEW PANELS FOR FISCAL YEAR 1990

Scientists from government, universities, and industry served on USDA/CSRS peer review panels this past year. Each panel was put together to fit the expertise needed for that specific granting area. The scientists involved are listed below alphabetically within their respective States.

ALABAMA

Sunnie Aburime
Alabama A&M Univ.

Yolanda Brady
Auburn Univ.

David E. Briles
Univ. of Alabama

Eloise Carter
Tuskegee Univ.

June Henton
Auburn Univ.

Victor Panangala
Auburn Univ.

David Stringfellow
Auburn Univ.

ALABAMA (CON'T)

Douglas Weigent
Univ. of Alabama

ARIZONA

Hans J. Bohnert
Univ. of Arizona

C. Seymour Card
Univ. of Arizona

Joseph Glenn Songer
Univ. of Arizona

Michael R. Wagner
Northern Arizona Univ.

ARKANSAS

Danny Davis
Univ. of Arkansas

ARKANSAS (CON'T)

Hubert Donovan Scott
Univ. of Arkansas

Seth Y. Young, III
Univ. of Arkansas

CALIFORNIA

Ransom Baldwin
Univ. of California

Linda F. Bisson
Univ. of California

Elizabeth A. Bray
Univ. of California

David L. Brink
California Forest Products
Laboratory

CALIFORNIA (CON'T)

Michael L. Christianson
Zeocon Research Institute

William O. Dawson
Univ. of California

Graham Gall
Univ. of California

Laurel Gerschwin
Univ. of California

Thomas R. Gordon
Univ. of California

Jerry L. Hedrick
Univ. of California

Neil E. Hoffman
Carnegie Institute of
Washington

Jodie S. Holt
Univ. of California

Anthony H. C. Huang
Univ. of California

CALIFORNIA (CON'T)

Anthony A. James
Univ. of California

Carl L. Keen
Univ. of California

Bohun B. Kinloch, Jr.
USDA, FS

N. James MacLachlan
Univ. of California

Miguel A. Marino
Univ. of California

Carole P. Meredith
Univ. of California

William W. Ruehl
Stanford Univ.

Athanasios Theologis
USDA, ARS

Jill A. Winter
Sandoz Crop Protection

CALIFORNIA (CON'T)

Tilahun Yilma
Univ. of California

COLORADO

Robert D. Glock
Colorado State Univ.

Terry M. Nett
Colorado State Univ.

Cleon W. Ross
Colorado State Univ.

Earl Stegman
Colorado State Univ.

CONNECTICUT

R. A. Aldrich
Univ. of Connecticut

Lindsay H. Allen
Univ. of Connecticut

David R. Benson
Univ. of Connecticut

CONNECTICUT (CON'T)

Timothy M. Nelson
Yale Univ.

Kristina Vogt
Yale Univ.

DELAWARE

Sherry Kitto
Univ. of Delaware

John Pierce
DuPont de Nemours Company,
Inc

Nancy S. Shepard
Dupont Experiment Station

Douglas Tallamy
Univ. of Delaware

DISTRICT OF COLUMBIA

David Berkowitz
USDA, FSIS

DISTRICT OF DISTRICT
(CON'T)

Bessie Berry
USDA, FSIS

Peter Brayton
USDA, CSRS

Ann Carey
USDA, SCS

George E. Cooper
USDA, CSRS

Frank Flora
USDA, CSRS

Clifford Gabriel
USDA, CSRS

H. Glenn Gray
USDA, CSRS

Suzanne Harris
International Life
Sciences Institute

DISTRICT OF COLUMBIA
(CON'T)

Richard Heifner
USDA, ERS

Billy E. Hooper
Association of American
Veterinary Medical
Colleges

Jon Irby
USDA, ES

Daniel Jones
USDA, OAB

Preston Jones
USDA, CSRS

Stanley L. Krugman
USDA, FS

Melvin Mathias
USDA, CSRS

McKinley Mayes
USDA, CSRS

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(CON'T)

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USDA, ES

Julia Miller
USDA, CSRS

Larry Miller
USDA, CSRS

Tom Mulvaney
Food & Drug Administration

Wayne K. Murphey
USDA, CSRS

Craig Osteen
USDA, ERS

Marcia Patten-Mallory
USDA, FS

Marshall Phillips
USDA, OAB

Kalman F. Salata
Walter Reed Army Medical
Center

DISTRICT OF COLUMBIA
(CON'T)

Allan Smith
USDA, ES

Bonnie Tanner
USDA, ES

James Walker
USDA, S&E

John Walker
U.S. Environmental
Protection Agency

Wells Willis
USDA, ES

Jim Wise
USDA, AMS

Robert C. Worrest
U.S. Environmental
Protection Agency

FLORIDA

Harold W. Browning
Univ. of Florida

FLORIDA (CON'T)

Carlton Davis
Univ. of Florida

L. Curtis Hannah
Univ. of Florida

Peter J. Hansen
Univ. of Florida

Pierce H. Jones
Univ. of Florida

Mary J. Saunders
Univ. of South Florida

Ronald H. Schmidt
Univ. of Florida

Rosalia Simmen
Univ. of Florida

Carlos E. Vallejos
Univ. of Florida

GEORGIA

Michael Adams
Univ. of Georgia

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Ivery D. Clifton
Univ. of Georgia

Dorothy B. Conteh
Fort Valley State College

Gary P. Green
Univ. of Georgia

Janice A. Kimpel
Univ. of Georgia

Gary D. Kochert
Univ. of Georgia

Russell L. Malmberg
Univ. of Georgia

James N. Moore
Univ. of Georgia

Malcolm Sumner
Univ. of Georgia

Robert O. Teskey
Univ. of Georgia

GEORGIA (CON'T)

Garrett Van Wicklen
Univ. of Georgia

HAWAII

Michael G. Hadfield
Univ. of Hawaii

IDAHO

Joseph G. Cloud
Univ. of Idaho

ILLINOIS

May R. Berenbaum
Univ. of Illinois

Donald Briskin
Univ. of Illinois

Anne E. Desjardins
USDA, ARS

John W. Erdman, Jr.
Univ. of Illinois

ILLINOIS (CON'T)

Nancy Fain
Univ. of Illinois

Gary L. Jackson
Univ. of Illinois

Alan L. Johnson
Univ. of Illinois

Sharon L. Knight
Univ. of Illinois

Gayle Lamppa
Univ. of Chicago

Harris Lewin
Univ. of Illinois

Raymond M. Miller
Argonne National
Laboratory

John E. Preece
Southern Illinois Univ.

Lawrence B. Schook
Univ. of Illinois

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Mike Tumbleson
Univ. of Illinois

Lila Vodkin
Univ. of Illinois

Kathleen H. Warner
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INDIANA

Janet S. Ayers
Purdue Univ.

Stephen P. Coburn
Fort Wayne State
Development Center

P. Michael Hasagawa
Purdue Univ.

Richard Lister
Purdue Univ.

INDIANA (CON'T)

John F. Senft
Purdue Univ.

H. Leon Thacker
Purdue Univ.

Steve Weller
Purdue Univ.

IOWA

Milton Allison
USDA, ARS

Lawrence H. Arp
Iowa State Univ.

Ronald A. Chung
Univ. of Northern Iowa

Ethan Hack
Iowa State Univ.

Theodore T. Kramer
Iowa State Univ.

IOWA (CON'T)

Michael Martin
Garst Seed Company

Phillip O'Berry
Iowa State Univ.

George W. Pugh
USDA, ARS

Ricardo Rosenbusch
Iowa State Univ.

Richard M. Shibles
Iowa State Univ.

Robert W. Thornburg
Iowa State Univ.

KANSAS

Gary Anderson
Sanofi Animal Health, Inc.

KANSAS (CON'T)

Jon Faubion
Kansas State Univ.

Brad W. Fenwick
Kansas State Univ.

Brice Hobrock
Kansas State Univ.

Scott McVey
Kansas State Univ.

David J. Mugler
Kansas State Univ.

Frank White
Kansas State Univ.

KENTUCKY

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Western Kentucky Univ.

Thomas W. Kimmerer
Univ. of Kentucky

KENTUCKY (CON'T)

David A. Smith
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LOUISIANA

Daniel H. Hwang
Pennington Biomedical
Research Center

Stephen C. Nickerson
Hillfarm Research Station

Dennis J. O'Callaghan
Louisiana State Univ.
Medical Center

William J. Platt
Louisiana State Univ.

Timothy G. Rials
USDA, FS

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MARYLAND

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Brad Berry
USDA, ARS

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Ejigou Demissie
Univ. of Maryland-
Eastern Shore

Howard Ray Gamble
USDA, ARS

Mary Ann Guadagno
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Dora K. Hayes
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Larry Hill

Doral Kemper
USDA, ARS

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Food & Drug Administration

Louis Liljedahl
USDA, ARS

Mark Lino
USDA, ARS

Dale Meyerdirk
USDA, APHIS

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Caird Eugene Rexroad, Jr.
USDA, ARS

Connie S. Schmaljohn
US Army Medical Research

Norberta Schoene
USDA, ARS

Frankie Schwenk
USDA, ARS

P. Gregory Smith
Society of American
Foresters

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Univ. of Maryland

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USDA, ARS

Edward Stephenson
Univ. of Maryland

Allan Stoner
USDA, ARS

Gene Swackhamer
Farm Credit Bank

John C. Watson
Univ. of Maryland

Frederick W. Wheaton
Univ. of Maryland

MASSACHUSETTS

Donald Arganbright
Univ. of Massachusetts

John P. Burand
Univ. of Massachusetts

MASSACHUSETTS (CON'T)

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Williams College

Emmett V. Schmidt
Harvard Medical School

Steve Smulski
Univ. of Massachusetts

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Michigan State Univ.

Ralph L. Fogwell
Michigan State Univ.

Douglas L. Foster
Univ. of Michigan

Eunice F. Foster
Michigan State Univ.

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Managing Decisions, Inc.

James L. Ireland
Michigan State Univ.

David F. Karnosky
Michigan Technological
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Derek T. A. Lamport
Michigan State Univ.

Carl F. Marrs
Univ. of Michigan

James Ray Miller
Michigan State Univ.

Julia Miller
Michigan State Univ.

Kurt S. Pregitzer
Michigan State Univ.

Alexander S. Raikhel
Michigan State Univ.

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Univ. of Minnesota

Ann M. Fallon
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David F. Grigal
Univ. of Minnesota

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